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Using the 8672ATME and 8672ATMM Modules

Passport 8000 Switch Series
Software Release 3.5

NORTEL NETWORKS™

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Preface

The 8672ATME and 8672ATMM ATM modules are part of the Nortel Networks* 8000 Series line of communications products. There are two versions of the ATM modules: the 8672ATME module and the 8672ATMM module (unless otherwise specified, the terms “8672 ATM modules” and “ATM modules” refer to both versions). This guide describes the features, operations, and configuration requirements for both versions.

Before you begin

This guide is intended for network installers and system administrators who are responsible for installing, configuring, or maintaining networks. This guide assumes that you have the following background:

- Understanding of the transmission and management protocols used on your network
- Experience with windowing systems or graphical user interfaces (GUIs)

Text conventions

This guide uses the following text conventions:

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: If the command syntax is `ping <ip_address>`, you enter `ping 192.32.10.12`
`bold Courier text`	Indicates command names and options and text that you need to enter. Example: Use the **`dinfo`** command. Example: Enter **`show ip`** {**`alerts`**|**`routes`**}.
braces ({})	Indicate required elements in syntax descriptions where there is more than one option. You must choose only one of the options. Do not type the braces when entering the command. Example: If the command syntax is `show ip {alerts|routes}`, you must enter either `show ip alerts` or `show ip routes`, but not both.
brackets ([ ])	Indicate optional elements in syntax descriptions. Do not type the brackets when entering the command. Example: If the command syntax is `show ip interfaces [-alerts]`, you can enter either `show ip interfaces` or `show ip interfaces -alerts`.
ellipsis points (. . .)	Indicate that you repeat the last element of the command as needed. Example: If the command syntax is `ethernet/2/1 [<parameter> <value>]...`, you enter `ethernet/2/1` and as many parameter-value pairs as needed.

italic text	Indicates new terms, book titles, and variables in command syntax descriptions. Where a variable is two or more words, the words are connected by an underscore. Example: If the command syntax is `show at <valid_route>`, `valid_route` is one variable and you substitute one value for it.
`plain Courier text`	Indicates command syntax and system output, for example, prompts and system messages. Example: `Set Trap Monitor Filters`
separator (>)	Shows menu paths. Example: Protocols > IP identifies the IP option on the Protocols menu.
vertical line (|)	Separates choices for command keywords and arguments. Enter only one of the choices. Do not type the vertical line when entering the command. Example: If the command syntax is `show ip {alerts|routes}`, you enter either `show ip alerts` or `show ip routes`, but not both.

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Chapter 1
8672 ATM modules concepts

The 8672 ATM modules provides network transmission using ATM technology. The ATM modules enable MAN/WAN/campus connectivity for the 8600 Switch with the capability to interconnect frame-switched networks using a backbone ATM network. The ATM modules also provide existing ATM customers with the capability for connectivity to the 8600 Switch. (For more information on ATM, refer to the ATM Forum Web site at the http://www.atmforum.com URL.)

The 8672 ATM modules occupy a single slot in an 8000 Series chassis. Two MDA bays (MDA 1 and MDA 2) allow you to attach optional Media dependent adapters (MDAs) that support a range of media types:

- 1-port OC-12c/STM-4: single-mode fiber (SMF) or multimode fiber (MMF) using the Synchronous Optical Network (SONET/SDH**)** media
- 4-port OC-3c/STM-1: SMF or MMF using SONET/SDH media
- 2-port DS-3

For a current list of MDAs for 8672 ATM modules and for instructions on how to install the MDAs, see *Installing Media Dependent Adapters for the 8672ATME and 8672ATMM Modules* on the hardware documentation CD you received with your 8672ATM module, or on the Nortel Networks documentation Web site at www.nortelnetworks.com/documentation.

The 8672 ATM modules for the 8000 Series chassis can be used as edge devices for WAN connectivity in the data center; they are used to connect the 8600 Switch to public or private ATM networks. You can also use the 8672 ATM modules in the wiring closet in inter-building connection technology in campus networks where each building is supported by frame-switched networks.

Another network application of the 8672 ATM modules is to directly connect one 8600 Switch with 8672 ATM modules in one building, to identical 8672 ATM modules in another 8600 Switch at another building. You connect the switches with a dedicated fiber link or with a SONET multiplex network. Each building may be individually supported by either frame-switched or ATM technology.

Table 1 describes the number of supported 8672 ATM modules in one 8000 Series chassis.

Table 1 Number of supported 8672 ATM modules in one 8000 Series chassis

Chassis	Description	Number of supported 8672 ATM modules
8010co chassis	10 slot chassis	6
8010 chassis	10 slot chassis	6
8006 chassis	6 slot chassis	3
8003 chassis	3 slot chassis	1

Refer to *Networking Concepts for the Passport 8000 Series Switch* for a thorough discussion of the complete functionality of the 8000 Series chassis product line, including the 8672 ATM modules. Note that VRRP, DiffServ, and ATM QoS are not supported on this module.

This chapter includes the following topics:

Features

The following features are included with 8672 ATM modules:

- RFC 1483 ATM PVC support
  - — Bridged PVC
  - — IP routed PVC
  - — IPX routed PVC
  - — IP and IPX routing over single PVC using LLC/SNAP encapsulation
- Both RFC 1483 LLC/SNAP encapsulation and Null encapsulation
- RFC 1483 point-to-multipoint bridging—up to 64 PVCs per ELAN
- MLT using bridged RFC 1483 PVCs
- VBR traffic shaping per VC channel
- STP support
- F5 OAM end-to-end loopback
- SONET statistics and ELAN/PORT level statistics
- Two MDA bays for installing optional media dependent adapters (MDAs) that support a range of media types
- Front-panel Online LED to monitor module operation
- Ability to remove and install a module (hot-swap) without resetting the switch (MDAs are not hot-swappable)
- AAL 5
- Hardware diagnostics
- Proprietary MIB support for configuration of RFC 1483 and ATM port specific setup
- Manageable through the Passport CLI or Device Manager, the SNMP-based graphical interface
- Monitored through a World Wide Web browser from anywhere on the network.

ATM ELANs, and ethernet VLANs

The 8672 ATM modules support ATM Forum Emulated LANs (ELANs). An ELAN extends an Ethernet VLAN, which is a broadcast domain, over an ATM network.

In general, there is a one-to-one mapping between an ATM ELAN and an Ethernet VLAN. An ATM ELAN never spans more than one ATM port because the software considers each ATM port completely separate.

The 8672 ATM modules participate in ELANs as RFC 1483 PVCs. Only Ethernet ELANs are supported**.**

If you delete a VLAN, you delete 1483 ELANs associated with the VLAN.

Note: Upon bootup or after a CPU failover, the error message `ERROR Task=tChasServ RTC update on standby CPU failed!` may appear. It has no negative impact on your switch.

Virtual network router

Virtual network router (VNR) refers to the routing functions between two ATM virtual/emulated networks. You can use the 8672 ATM modules as an IP- and IPX-optimized VNR.

Traffic shaping

The 8672 ATM modules provide per channel traffic shaping and supports unspecified bit rate and variable bit rate (VBR). Channels with a specified cell rate are called rate-shaped channels.

The VBR service provided by the 8672 ATM modules allow a previously idle channel to burst at a relatively high Peak Cell Rate (PCR) for a Maximum Burst Size (MBS) of ATM cells. If the channel exhausts its MBS, the module reduces the channel's rate to a Sustained Cell Rate (SCR). When the channel stops transmitting, it accumulates credit towards another burst at PCR.

RFC 1483 support

The system software on the 8672 ATM modules support the configuration of RFC 1483 LAN clients with multiprotocol encapsulation. RFC 1483 supports standards-based methods of encapsulation that enable connectivity with third-party ATM devices. Multiprotocol encapsulation provides the capability to set up PVCs between Centillion ATM virtual ports (VPorts) and other clients based on LLC encapsulation. The current Centillion platform only supports bridged variations of RFC 1483.

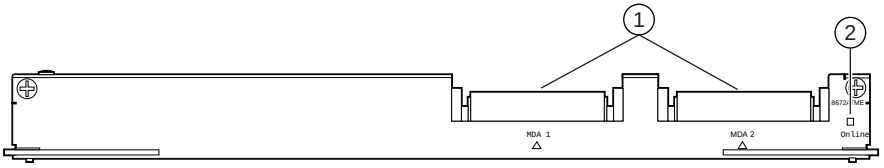
The 8672 ATM modules support the following types of RFC 1483 ELANs:

- RFC 1483 bridged 802.3. The links can be set up within a single device or with another switch. Multiple RFC 1483 links can be set up within one ELAN. Both LLC and NULL encapsulation are supported.
- RFC 1483 routed IP and IPX. An RFC 1483 routed VLAN always contains only one PVC, corresponding to a point-to-point link between routers. The software adds and removes the MAC header, as appropriate. When configuring an IP and IPX routed circuit, the ATM port must be the only port assigned to the VLAN.

Physical description

8672 ATM modules have two bays for installing optional MDAs. Figure 1 shows an 8672 ATM module with both bays (MDA1 and MDA 2) empty.

Figure 1 Passport 8672ATME/ATMM module



1 = MDA bays
2 = Module Online LED

9901EC

The 8672 ATM modules use a single Online LED to indicate the operational status of the module (see “Module online LED, next).

The 8672 ATM modules (optional) MDAs are provided with their own LEDs (see “Media dependent adapters” on page 28).

To configure and manage the 8672 ATM modules, connect to the console port of your switch fabric CPU module (8691SF Module). For information on connecting to the console port, refer to the installation guide that came with your switch.

Module online LED

The front panel of the 8672 ATM modules have an Online LED that indicates whether or not the module has power applied and is initialized correctly.

When the 8672 ATM modules are first inserted into the chassis, the Online LED turns amber until the board is recognized by the system and passes a power-on self-test. If the module fails the self-test, the light is off. When the board passes the self-test and goes online, the LED illuminates a solid green.

Note: You cannot configure the 8672 ATM modules until the online LED on the module is steadily lit green and you have inserted at least one MDA.

Table 2 describes the 8672 ATM modules online LED.

Table 2 Passport 8672ATME/ATMM LED

Color/State	State
Green	The module is receiving power and is ready to receive and transmit traffic.
Amber	The module is initializing and performing diagnostic self-tests.
Off	The module is offline and not receiving power.

Media dependent adapters

For a current list of media dependent adapters for 8672 ATM modules, see *Installing Media Dependent Adapters for the 8672ATME and 8672ATMM Modules* on the hardware documentation CD you received with your 8672ATM module, or on the Nortel Networks documentation Web site at www.nortelnetworks.com/documentation.

Switch fabric console port

You can use the Console port on the switch fabric CPU module (8691SF Module) to establish a local CLI or Device Manager session for the 8672 ATM modules. For information on connecting to the Console port, refer to the appropriate installation manual for your 8000 Series chassis.

ATM Module terminology

This section describes relevant terms and acronyms used with the ATM modules.

The following topics are included:

ATM terms and acronyms

Asynchronous transfer mode (ATM) is a connection-oriented, cell-based technology that relays traffic across a network. ATM provides a cost-effective way of transmitting voice, video, and data across a network at high speeds. It offers topology-independent, resilient networking technology.

An ATM cell is a fixed-length packet of 53 bytes. It consists of a 5-byte header containing address information and a fixed 48-byte information field. The fixed-length cell size allows you to predict network delays.

The following terms and acronyms are frequently used with ATM information:

- ATM: Asynchronous transfer mode. ATM is a switched, connection-oriented, fixed-length, cell-based transmission method specifically designed to run at high data rates and to carry a complete range of user traffic, including voice, data, and video. ATM uses dedicated media connections running in parallel, allowing simultaneous multiple connections through a single switch device at very high speeds.
- PVC: Permanent virtual circuit. Dedicated connection between devices that is manually set up.
- SVC: Switched virtual circuit. On-demand connection between an ATM or frame relay source and destination that lasts for the duration of the transmission.
- VC: Virtual circuit. This is a network service that provides connection-oriented service regardless of the underlying network structure.

- VP: Virtual path. A virtual path is a set of virtual channels between a common source and destination. The virtual channels in a virtual path are logically associated with a common identifier, the virtual path identifier.
- VPI: Virtual path identifier. Identifier contained in the ATM cell header to designate the virtual path on the physical ATM link.
- VCI: Virtual circuit identifier. Address or label contained in the ATM cell header to designate the virtual circuit within the virtual path on the physical ATM link
- ELAN: Emulated LAN. Following the ATM Forum specification, ELANs make connection-oriented ATM networks look like connectionless LANs.
- UBR: Unspecified bit rate. UBR is an ATM service category that does not specify traffic-related service guarantees. No numerical commitments are made with respect to the cell loss ratio or to the cell transfer delay.
- VBR: Variable bit rate. VBR is an ATM Forum-defined service category that supports variable bit rate data traffic with average and peak traffic parameters.
- PCR: Peak cell rate. The PCR, in cells/second, is the maximum cell rate.
- SCR: Sustainable cell rate. The SCR is an upper bound on the cell rate that is long relative to that of the PCR. Enforcement of this bound by the Usage Parameter Control allows the network to allocate sufficient resources, but less than those for the PCR, to ensure that the specified cell loss ratio can be achieved.
- MBS: Maximum burst size. The signaling method determines the MBS, which is coded as a number of cells, that can be transmitted at peak rate and still conform to the overall algorithm.

Data transmission (also called cell switching) through the ATM network relies on establishing logical connections between ATM devices. ATM is a connection-oriented service, which means that an ATM device cannot transmit information until it establishes a connection with a receiving device.

SONET terms and acronyms

This section provides a brief listing of common Synchronous Optical Network (SONET) terms. SONET is an American National Standards Institute (ANSI) standard for transmitting information over optical fiber. This standard is used and accepted in the United States and Canada and is a variation of the Synchronous Digital Hierarchy (SDH) International standard.

The following terms and acronyms are frequently used with SONET information:

- SONET: Synchronous Optical Network. SONET is a family of fiber optic transmission rates that provides the flexibility to transport many digital signals with different capacities. This ANSI standard provides for transmission from OC-1 to OC-48 and greater.
- SDH: Synchronous Digital Hierarchy. SDH is a standard technology for optical fiber-based synchronous data transmission. SDH is the international equivalent of SONET.
- OC-3: Optical Carrier-level 3. OC-3 is an optical fiber transmission system at 155 Mb/s.
- OC-3c/STM-1: Optical Carrier-level 3 concatenation. OC-3c/STM-1 is an optical fiber transmission system that carries STS-3c/STM-1 frame structures at 155 Mb/s. Concatenation refers to the fact that there is only one logical data stream (rather than supporting a channelized structure).
- OC-12: Optical Carrier-level 12. OC-12 is an optical fiber transmission system at 622 Mb/s.
- OC-12c/STM-4: Optical Carrier-level 12 concatenation. OC-12c/STM-4 is an optical fiber transmission system that carries STS-12c/STM-4 frame structures at 622 Mb/s. Concatenation refers to the fact that there is only one logical data stream (rather than supporting a channelized structure).

SONET transmission rates

The following transmission rates are commonly used with SONET:

- OC-3c/STM-1: 155.52 Mb/s (and SDH/STM-1)
- OC-12c/STM-4: 622.08 Mb/s (and SDH/STM-4)

The SONET specification defines optical both as:

- Single-mode fiber (SMF)
- Multimode fiber (MMF)

Note: The estimated maximum transmission distance for OC-3c SMF is 20 kilometers (km); for OC-3c MMF is 2 km; for OC-12c SMF is 15 km; for OC-12c MMF is 500 m.

Digital Signal, Level 3 (DS-3) support

Note: You must enable the F5-OAM parameter for each PVC on the DS3 interface to properly detect far end link failures.

The 8672 ATM modules support the Digital Signal, Level 3 (DS-3) transmission rate (as described in the following list).

The following terms describe the digital hierarchy signaling rates that correspond to standards set by the North American Digital Hierarchy signaling standards:

- DS-0: Digital Signal, Level 0: The 64 kbps rate that is the basic building block for both the North American and European digital hierarchies.
- DS-1: Digital Signal, Level 1: The North American Digital Hierarchy signaling standard for transmission at 1.544 Mb/s. This standard supports 24 simultaneous DS-0 signals. The term is often used interchangeably with T1 carrier although DS-1 signals may be exchanged over other transmission systems.
- DS-2: Digital Signal, Level 2: The North American Digital Hierarchy signaling standard for transmission of 6.312 Mb/s that is used by T2 carrier which supports 96 calls.
- DS-3: Digital Signal, Level 3: The North American Digital Hierarchy signaling standard for transmission at 44.736 Mb/s that is used by T3 carrier. DS-3 supports 28 DS-1s plus overhead.

Chapter 2
Configuration considerations and limitations

This chapter describes configuration limitations and interoperability issues that you should consider when configuring your 8672 ATM modules.

This chapter includes the following topics:

Creating ATM 1483 PVCs for an ELAN with MLT

To create ATM 1483 PVCs for an ELAN with MLT, perform the following steps:

1. Create a MLT group.
2. Move the ATM ports into the MLT group.
3. Create a VLAN and associate the MLT group with that VLAN.
4. Create the ATM 1483 PVCs for that ELAN.

Be sure to complete the sequence of steps as described above. If you do not complete the steps in the correct sequence (for example, creating the VLAN/MLT group association, and 1483 PVC, etc.), the system displays the following error message:

```
Deleting the ATM Elan associated with Vlan
```

And, the associated ELAN is deleted.

Link traffic exceeds configured SCR value

Due to non-linear behavior of the SAR chip, link traffic can exceed the sustained cell rate (SCR) value configured for that link.

If you oversubscribe the sustained cell rate (SCR) on ATM ports, the output rate increases slightly.

Oversubscribing PVCs

If you configure 256 VBR PVCs on MDAs, be sure that you do not oversubscribe the MDAs. Oversubscribing MDAs can result in inconsistent shaping behavior.

Connecting ATM ports to third-party devices

If you connect an ATM port to a third-party device, you must configure the maximum transmission unit (MTU) setting on the third-party device to less-than or equal-to 1950 bytes.

For the OSPF protocol, the IP protocol MTU setting on the third-party device must be 1500 bytes to avoid MTU mismatch alarms (implemented in accordance with RFC 2178).

If the interface MTU is changed to indirectly set the OSPF MTU, the MTU setting can be slightly smaller or larger than 1500 bytes, depending on whether the third-party device includes any header and/or trailers in the MTU calculation.

DiffServ code point

You cannot direct-map the DiffServ code point (DSCP) to the ATM class of service. However, you can assign a QoS level to the Ethernet VLAN and then map a VBR PVC to that VLAN and turn the shaping on that PVC.

Dynamically changing IPX encapsulation type

You can change Ethernet II, LLC, SNAP, and RAW for IPX frame encapsulations dynamically by following these steps:

1. Delete the ATM IPX ELAN.
2. Change the IPX encapsulation type for the VLAN.
3. Re-create the ATM IPX ELAN.

Ensuring correct STP operation

When configuring 8672 ATM modules, if you select a default Spanning Tree Group (STG) and a default VLAN ID, the resulting topology may cause incorrect Spanning Tree Protocol (STP) behavior.

To ensure that STP functions properly, create a user-defined Spanning Tree Group and user-defined VLAN ID.

Layer 2 redundancy

8672 ATM modules do not support Layer 2 redundancy.

Management disabling an 8672 ATM module

- Links on switches connected to an 8672 ATM/ATMM module do not continue to receive a signal from the module, even when you administratively disable the module using either the CLI or Device Manager.
- When an 8672 ATM module port is management disabled the ports will continue to send IDLE cells. The value displayed for the OUT CELLS counter includes idle cells, and will increment accordingly.

For more information about the F5-OAM feature, see “Configuring ATM F5-OAM End-to-End Loopback” on page 68.

Rapid insert/removal of ATM modules

You can swap only one card at a time, and only after all other cards have been initialized. If you do not wait, the hardware check on the second swapped card fails and either puts the card offline, or scrolls error messages on the console.

show ports stats atmport slot/port command

When the **`show ports stats atmport slot/port`** command displays ATM port statistics, the `OUT CELLS` counter value includes the idle cells, while the `IN CELLS` counter value does not. This difference is due to a limitation in the hardware. The values displayed for the counters `OUT PKTS` and `IN PKTS` remain accurate.

monitor port stat inter util slot/port command

On a Passport 8600 switch, the **monitor port stat inter util slot/port** CLI command does not collect statistics for ATM ports. Use the CLI command **show port stats atmport** to monitor ingressing and egressing traffic.

Default tagging on ATM ports

Tagging is enabled by default on ATM ports and cannot be disabled. If you attempt to use Device Manager to disable tagging on ATM ports, Device Manager will prompt you with an error message.

Topology Discovery

ATM ports do not support Topology Discovery.

Viewing ATM port statistics

You can use the CLI to view ATM port statistics; ATM port statistics are not available using Device Manager.

Centillion C100 interoperability

In certain scenarios, Multilink Trunking (MLT) does not fail over to another link if forwarding link is broken by passthrough C100. This behavior works correctly with the C1000.

Performance of OC-3 MDA with small packet sizes

For small packet sizes (64 and 128 bytes), using only one port of the four port OC-3 MDA provides four times the performance compared to using all four ports of the OC-3 MDA. For all other packet sizes, there is no discernible performance difference.

Multiple VBR PVCs on the same port

When configuring multiple VBR PVCs on the same ATM port, it is highly recommended that each of them should have different SCR, PCR and MBS values

IP and IPX routing over a single PVC

IP and IPX routing over a single PVC can be configured as a routed 1483 PVC with LLC/SNAP encapsulation only. The user needs to specify one IP address and one IPX network address on this PVC. It is recommended that the user should not configure more than 200 such PVC’s per Passport 8600 system.

Chapter 3
Using Device Manager to configure 8672 ATM modules

Two management tools enable you to configure your 8672 ATM modules: Device Manager and the command line interface (CLI). This chapter describes how to configure your 8672 ATM modules using Device Manager.

Passport Device Manager is an SNMP-based graphical user interface tool designed to manage single devices. To use Device Manager, you must have network connectivity to a management station running Device Manager on one of the supported platforms. For information on all aspects of installing and running Device Manager, refer to: *Getting Started with the Passport 8000 Series Switch Management Software.*

Chapter 5, “Configuration examples,” on page 133 provides typical configuration examples that you can refer to when configuring your 8672 ATM modules.

You can also use the embedded Web-based management feature to monitor 8672 ATM modules (see Chapter 6, “Web Management,” on page 167).

This chapter includes following topics:

Port numbering

You must install an MDA into the 8672 ATM modules in order to have connectivity. The module contains two slots for MDAs. You can install one or two of the following MDAs:

- 1-port OC-12c/STM-4
- 4-port OC-3c/STM-1
- 2-port DS-3

The management system identifies an interface by its slot number (in the 8000 Series chassis) and its port number, using the syntax slot number/port number (s/p). The 8672 ATM modules can contain up to eight ports when two 4-port MDAs are inserted. Port numbers 1 to 4 are reserved for the MDA in the left slot regardless of the actual physical number of ports. Port numbers 5 to 8 apply to the MDA in the right slot regardless of the actual physical number of ports.

For example, if you have an 8672 ATM module in the third slot of the 8000 Series chassis with an OC-12c/STM-4 MDA in the left slot and an OC-3c/STM-1 MDA in the right slot, the following slot/port numbers are used for management and configuration:

- 3/1: OC-12c
- 3/5: OC-3c/STM-1, left port
- 3/6: OC-3c/STM-1, port second from left
- 3/7: OC-3c/STM-1, port second from right
- 3/8: OC-3c/STM-1, right port

As another example of port numbering, an 8672 ATM module in the second slot of the chassis with two OC-12c/STM-4 MDAs installed has the following port numbers:

- 2/1: OC-12c/STM-4, left
- 2/5: OC-12c/STM-4, right

An 8672 ATM module with two OC-3c/STM-1 MDAs installed has ports numbered consecutively 1 through 8, from left to right.

Configuring and managing ATM

This section describes how to use Device Manager to configure and manage ATM, and includes the following topics:

Changing default settings

To change the default settings on the 8600 Switch or to perform any configuration tasks in Device Manager:

➔ On the device view, double-click on the port you want to configure.

The Port dialog box opens with the Interface tab displayed (Figure 2).

Figure 2 Interface tab—ATM

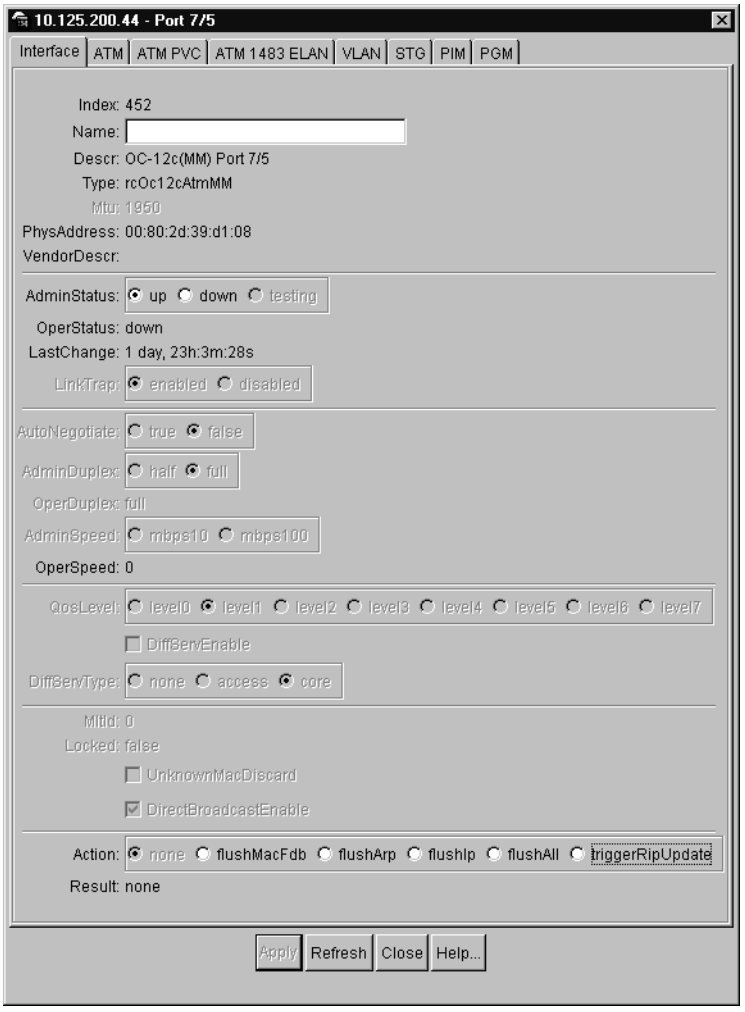


Table 3 describes the Interface tab fields.

Table 3 ATM Interface tab fields

Item	Description
Index	Unique value assigned to each interface. The value ranges between 16 and 255.
Name	Displays the name of this port. To assign or change a name to the port, highlight the field and enter alphanumeric characters.

Table 3 ATM Interface tab fields (continued)

Item	Description
Descr	Displays the port type of this interface, which may be: • OC-3c MMF or SMF • OC-12c MMF or SMF • DS-3 The card slot and port numbers are also shown.
Type	Displays the media type of this interface, which may be: • rcOc3cAtmSM • rcOc3cAtmMM • rcOc12cAtmSM • rcOc12cAtmMM • rcDs3
PhysAddress	MAC address assigned to a particular interface.
VendorDescr	Vendor description.
AdminStatus	Sets the port to either of the following states: • up • down When a managed system initializes, all interfaces start with AdminStatus in the down state. As a result of either management or configuration action, the AdminStatus is changed to the up state (or remains in the down state).
OperStatus	Displays the current operational state of the interface, either: • up • down If AdminStatus is down, then OperStatus should be down. If AdminStatus is changed to up, then OperStatus should change to up if the interface is ready to transmit and receive network traffic. It should remain in the down state if and only if there is a fault that prevents it from going to the up state.
LastChange	Displays the value of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last reinitialization of the local network management subsystem, the value is zero.
OperSpeed	Displays the current operating speed of the ATM port. For OC-3c, the operating speed is 155.52 Mb/s; for OC-12c, it is 622.08 Mb/s; for DS-3 it is 44.736 Mb/s.
MultiMediaPlatformAndDevice	Opens a dialog box that allows you to select the platform and device for multimedia.
TelephonyAndMultiMediaFilterEnable	Enables IP telephony and MultiMedia Filters.

Table 3 ATM Interface tab fields (continued)

Item	Description
MltID	Multi-Link Trunk to which the port is assigned (if any).
Locked	Displays whether or not the port is locked. When locked, the port configuration cannot be changed. To lock or unlock a port, select Edit > Security > Port Lock.
Action	Sets one of the following port-related actions: • none • flushMacFdb—flush MAC forwarding table for port • flushArp—flush ARP table for port • flushIp—flush IP route table for port • flushAll—flush all tables for port • triggerRipUpdate—manually update the RIP table
Result	Displays result from the last system action.

Resetting the module

To reset the module:

1. Highlight the module.
2. From the Device Manager menu bar, choose Edit > Card.

   The Card dialog box opens with the Card tab displayed (Figure 3).

Figure 3 Card tab

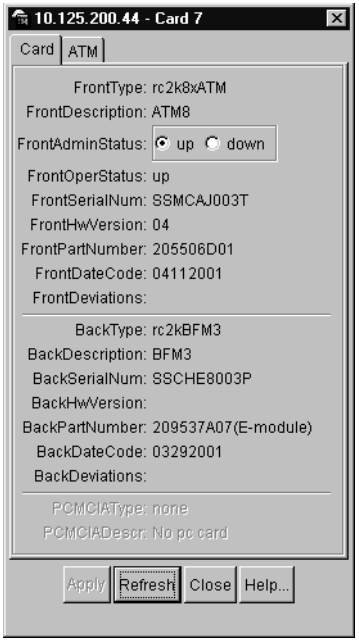


Table 4 describes the Card tab fields.

Table 4 Card tab fields

Field	Description
FrontType	Card type.
FrontDescription	ATM.
FrontAdminStatus	Administrative status of the card.
FrontOperStatus	Operational status of the card.
FrontSerialNum	Serial number of card.
FrontHWVersion	Hardware version.
FrontPartNumer	Part number.
FrontDateCode	Date code.
FrontDeviations	Deviations.
BackType	Card back type.
BackDescription	Description.
BackSerialNum	Serial Number.

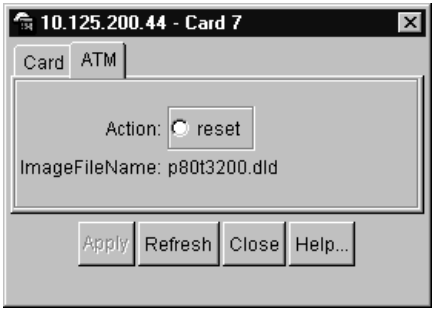
Table 4 Card tab fields (continued)

Field	Description
BackHWVersion	Hardware version.
BackPartNumer	Part number.
BackDateCode	Date code.
BackDeviations	Deviations.

3 Click the ATM tab.

The ATM tab opens (Figure 4).

Figure 4 ATM tab



4 Click reset.

5 Click Apply.

Viewing MDA information

To view information on the MDA you are using,

1 Highlight the MDA.

2 From the Device Manager menu bar, choose Edit > MDA.

The MDA dialog box opens (Figure 5).

Figure 5 MDA dialog box

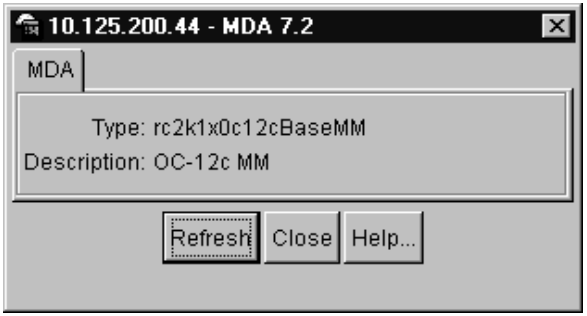


Table 5 describes the MDA dialog box fields.

Table 5 MDA dialog box fields

Field	Description
Type	Media type: • rc<XXXX>Oc3BaseSM. • rc<XXXX>Oc3BaseMM. • rc<XXXX>Oc12BaseSM. • rc<XXXX>Os12BaseMM. • rc<XXXX>Ds3
Description	MDA type: • Quad OC-3c SM — quad port OC-3c single-mode fiber. • Quad OC-3c MM — quad port OC-3c multimode fiber. • OC-12c SM — single port OC-12c single-mode fiber. • OC-12c MM — single port OC-12c multimode fiber. • Dual DS3 MDA — 2-port DS-3

Enabling or disabling a port

You can enable or disable a port by two methods. To enable or disable a port through the Device Manager menu bar:

1. On the device view, highlight a port.
2. From the Device Manager menu bar, choose Edit > Port.

   The Port dialog box opens with the Interface tab displayed (Figure 2).

3 In the AdminStatus area, click up to enable the port, or click down to disable the port.

4 Click Apply.

To enable or disable a port using a shortcut menu:

1 Right-click on the port.

A shortcut menu opens.

2 Choose Enable or Disable.

Editing ATM and framing parameters

To view or change the ATM and framing parameters of the port:

1 On the device view, highlight a port.

2 From the Device Manager menu bar, choose Edit > Port.

The Port dialog box opens with the Interface tab displayed (Figure 2).

3 Click the ATM tab.

The ATM tab opens (Figure 6).

Figure 6 ATM tab

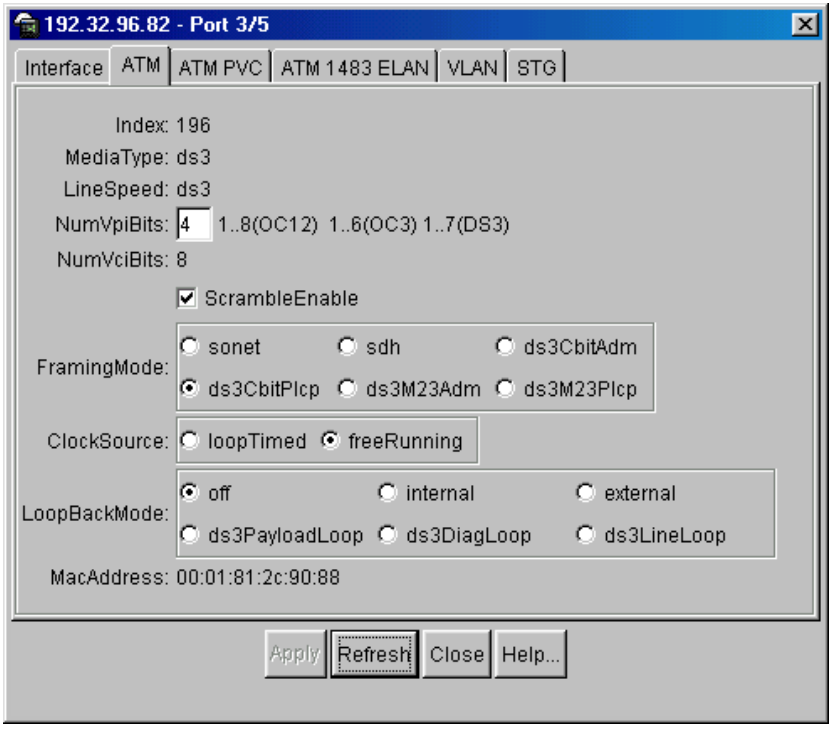


Table 6 describes the ATM tab fields.

Table 6 ATM tab fields

Item	Description
Index	Interface Index.
MediaType	mmf (multimode fiber), smf (single-mode fiber), or ds3 (direct signal, level 3)
LineSpeed	For OC-3c, the operating speed is 155.52 Mb/s; for OC-12c, it is 622.08 Mb/s; for DS-3 it is 44.736 Mb/s.
NumVpiBits	For OC-3c, 11 bits split between NumVpiBits and NumVciBits. NumVpiBits cannot exceed 6 bits for OC-3c. For OC-12c, 13 bits split between NumVpiBits (default is 4) and NumVciBits (default is 9). NumVpiBits cannot exceed 8 bits for OC-12c. For DS-3, 12 bits split between NumVpiBits (default is 4) and NumVciBits (default is 8). NumVpiBitscannot exceed 7bits for DS-3.

Table 6 ATM tab fields (continued)

Item	Description
NumVciBits	This field is read only. It takes remaining bits from NumVpiBits. For example, if NumVpiBits is 3 for OC-3c, then NumVciBits is 8.
ScrambleEnable	Sets the port to scramble the data by clicking the box.
FramingMode	Sets the framing for the port to: • SONET (Synchronous Optical Network), the standard format used in North America. • SDH (Synchronous Digital Hierarchy), the standard format used worldwide except in North America. • Any of the following Digital Signal, Level 3 (DS-3) formats: — ds3CbitAdm — ds3CbitPlcp — ds3M23Adm — ds3M23Plcp
ClockSource	Sets the clock source for the port to: • loopTimed, which means clocking is derived from the SONET line. • freeRunning, which means clocking is derived from the on-board clock. Note: If you have two connected 8672 ATM moduless, you must set both to freeRunning or one to freeRunning and one to loopTimed; do not set both to loopTimed.
LoopBackMode	Sets the loopback mode to: • off • internal • external • ds3PayloadLoop • ds3DiagLoop • ds3LineLoop
MacAddress	MAC address assigned to a particular interface.

Editing circuit parameters

To view and configure ATM PVC parameters:

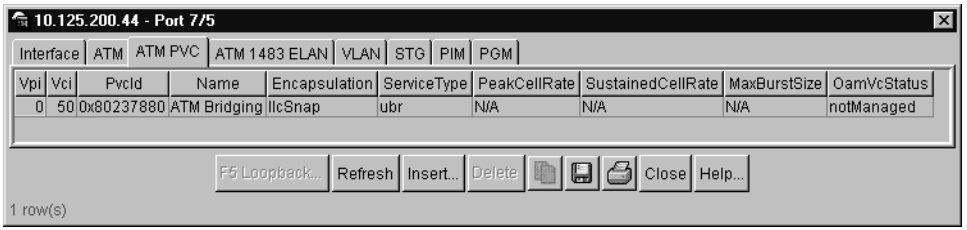
1. On the device view, highlight a port.
2. From the Device Manager menu bar, choose Edit > Port.

   The Port dialog box opens with the Interface tab displayed (Figure 2).

3 Click the ATM PVC tab.

The ATM PVC tab opens (Figure 7).

Figure 7 ATM PVC tab



Note: PVC displays are not sequential in Device Manager.

Table 7 describes the ATM PVC tab fields.

Table 7 ATM PVC tab fields

Item	Description
Vpi	Virtual path identifier.
Vci	Virtual circuit identifier.
PvcId	Internal index ID of the PVC.
Name	Emulated LAN name.
Encapsulation	Encapsulation type: null or llcSnap.
ServiceType	Unspecified bit rate (ubr) or variable bit rate (vbr).

Table 7 ATM PVC tab fields (continued)

Item	Description
PeakCellRate	Peak cell rate, in cells/second, is the maximum cell rate. The valid ranges are: • OC-3—86..353207 • OC-12—86..733490 • DS3—86..96000 Note: IP multicast traffic between a Passport module and other devices may not perform as well as expected unless the peak cell rate and the sustained cell rate values are updated to their maximum values; only applicable if the Service Type is vbr.
SustainedCellRate	Sustained cell rate is an upper boundary on the cell rate that is relative to that of the PCR; only applicable if the Service Type is vbr. The valid ranges are: • OC-3—86..353207 • OC-12—86..733490 • DS3—86..96000
MaxBurstSize	Maximum burst size determined by the signaling method; It is coded as a number of cells that can be transmitted at peak rate and still conform to the overall algorithm; only applicable if the Service Type is vbr. The valid range is 2 to 255
OamVcStatus	Indicates the status of the PVC link.

4 Click Insert.

The Insert ATM PVC dialog box opens (Figure 8).

Figure 8 Insert ATM PVC dialog box

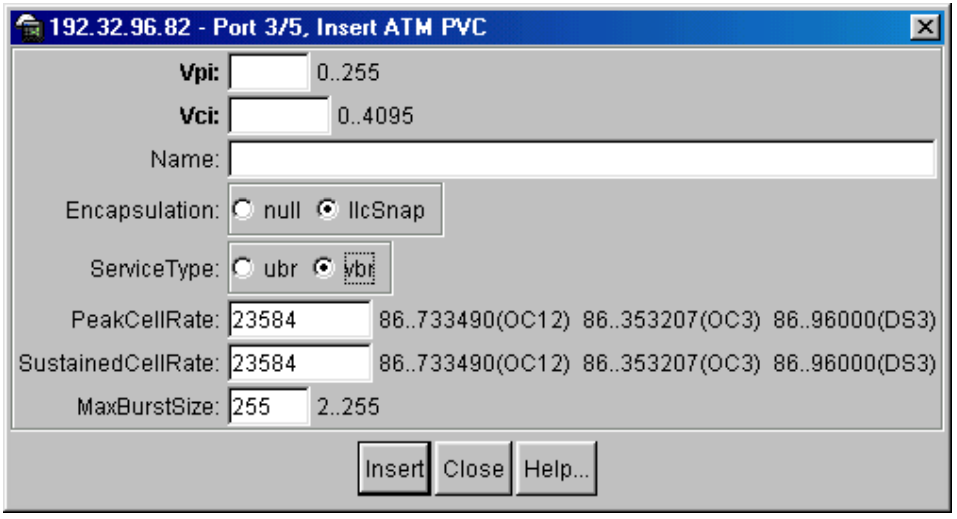


Table 8 describes the Port, Insert ATM PVC dialog box fields.

Table 8 Insert ATM PVC dialog box fields

Item	Description
Vpi	Virtual Path Identifier.
Vci	Virtual Circuit Identifier. **Note:** For <vpi.vci>, 0.0 is not supported.
Name	Alphanumeric characters to assign a name to the PVC.
Encapsulation	Encapsulation type: null or llcSnap.
ServiceType	Unspecified bit rate (ubr) or variable bit rate (vbr).
PeakCellRate	Peak cell rate, in cells/second, is the maximum cell rate for the interface type. Only applicable if the Service Type is vbr. The valid ranges are: • OC-3—86..353207 • OC-12—86..733490 • DS3—86..96000

Table 8 Insert ATM PVC dialog box fields (continued)

Item	Description
SustainedCellRate	Sustained cell rate is an upper boundary on the cell rate that is relative to that of the PCR; only applicable if the Service Type is vbr. The valid ranges are: • OC-3—86..353207 • OC-12—86..733490 • DS3—86..96000 Numeric value, within the range 86...733490; only applicable if the Service Type is vbr.
MaxBurstSize	Numeric value, within the range 2...255; only applicable if the Service Type is vbr.

5 In the Vpi field, type the Virtual Path Identifier.

6 In the Vci field, type the Virtual Circuit Identifier.

Note: For <vpi.vci>, 0.0 is not supported.

7 In the Name field, type the name of the ATM PVC.

8 In the Encapsulation field, select the encapsulation method (null or IIcSnap).

9 In the Service Type field, select the service type (ubr or vbr).

10 If you select vbr in the Service Type field:

- **a** In the PeakCellRate field, enter the PCR value (see See Table 8 on page 53 for the range limits).
- **b** In the SustainedCellRate field, enter the SCR value (see See Table 8 on page 53 for the range limits).
- **c** In the MaxBurstSize, type the maximum burst size value (see See Table 8 on page 53 for the range limits).

11 Click Insert.

The Insert ATM PVC dialog box closes.

12 Click Close.

Editing circuit parameters (multiple ports)

You can also view and configure ATM PVC parameters using the Edit > ATM menu choice.

1 From the Device Manager menu bar, choose Edit > ATM.

The ATM dialog box opens with the ATM PVC tab displayed.(Figure 9) All ATM PVCs in the system can be viewed from this tab.

Figure 9 Edit >ATM, ATM PVC tab

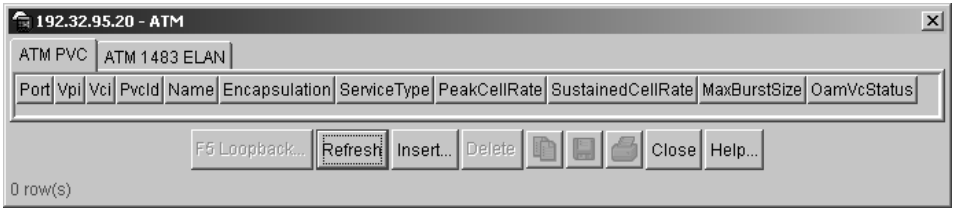


Table 9 describes the Edit >ATM, ATM PVC tab fields.

2

Table 9 ATM PVC tab fields

Item	Description
Port	Port Number
Vpi	Virtual path identifier**.**
Vci	Virtual circuit identifier.
PvcId	Internal index ID of the PVC.
Name	Emulated LAN name.
Encapsulation	Encapsulation type: null or llcSnap.
ServiceType	Unspecified bit rate (ubr) or variable bit rate (vbr).

Table 9 ATM PVC tab fields (continued)

Item	Description
PeakCellRate	Peak cell rate, in cells/second, is the maximum cell rate. The valid ranges are: • OC-3—86..353207 • OC-12—86..733490 • DS3—86..96000 Note: IP multicast traffic between a Passport module and other devices may not perform as well as expected unless the peak cell rate and the sustained cell rate values are updated to their maximum values; only applicable if the Service Type is vbr.
SustainedCellRate	Sustained cell rate is an upper boundary on the cell rate that is relative to that of the PCR; only applicable if the Service Type is vbr. The valid ranges are: • OC-3—86..353207 • OC-12—86..733490 • DS3—86..96000
MaxBurstSize	Maximum burst size determined by the signaling method; It is coded as a number of cells that can be transmitted at peak rate and still conform to the overall algorithm; only applicable if the Service Type is vbr. The valid range is 2 to 255
OamVcStatus	Indicates the status of the PVC link.

3 Click Insert

The Edit > ATM, Insert ATM PVC dialog box opens. (Figure 10)

Figure 10 Edit > ATM, Insert ATM PVC dialog box

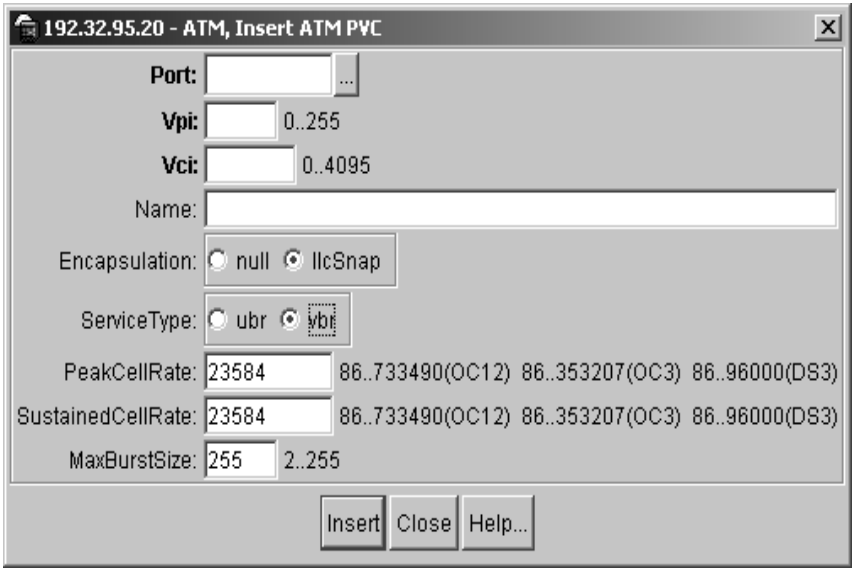


Table 10 describes the Edit >ATM, Insert ATM PVC dialog box fields.

Table 10 Edit > ATM, Insert ATM PVC dialog box fields

Item	Description
Port	Port Number
Vpi	Virtual Path Identifier.
Vci	Virtual Circuit Identifier. **Note:** For <vpi.vci>, 0.0 is not supported.
Name	Alphanumeric characters to assign a name to the PVC.
Encapsulation	Encapsulation type: null or llcSnap.
ServiceType	Unspecified bit rate (ubr) or variable bit rate (vbr).
PeakCellRate	Peak cell rate, in cells/second, is the maximum cell rate for the interface type. Only applicable if the Service Type is vbr. The valid ranges are: • OC-3—86..353207 • OC-12—86..733490 • DS3—86..96000

Table 10 Edit > ATM, Insert ATM PVC dialog box fields (continued)

Item	Description
SustainedCellRate	Sustained cell rate is an upper boundary on the cell rate that is relative to that of the PCR; only applicable if the Service Type is vbr. The valid ranges are: • OC-3—86..353207 • OC-12—86..733490 • DS3—86..96000 Numeric value, within the range 86...733490; only applicable if the Service Type is vbr.
MaxBurstSize	Numeric value, within the range 2...255; only applicable if the Service Type is vbr.

4 In the Port field, click the button to view ports.

5 Select the ATM port and click OK.

6 In the Vpi field, the Virtual Path Identifier.

7 In the Vci field, the Virtual Circuit Identifier.

8 In the Name field, type the name of the ATM PVC.

9 In the Encapsulation field, select the encapsulation method (null or IIcSnap).

10 In the Service type field, select the service type (ubr or vbr).

11 If you select vbr in the Service type field, complete these fields:
Peak Cell Rate, Sustained Cell Rate, and Max Burst Size in the appropriate fields.

12 Click Insert.

13 The ATM, Insert ATM dialog box closes, and the ATM PVC tab is redisplayed.

14 Click Close.

Deleting a PVC

To delete a PVC:

1 On the device view, highlight a port.

2 From the Device Manager menu bar, choose Edit > Port.

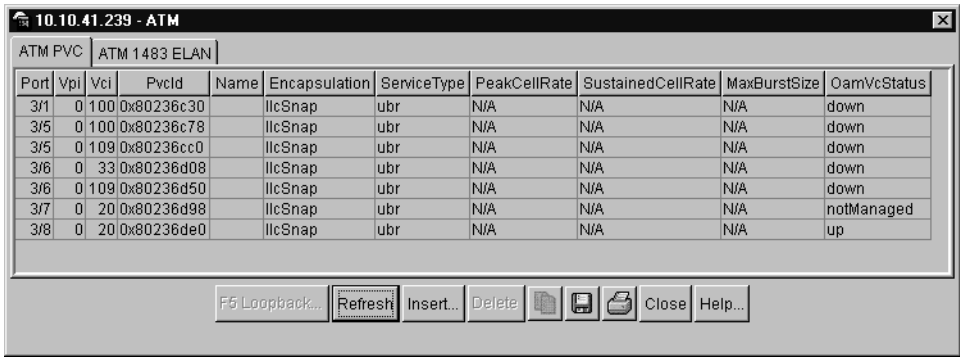
The Port dialog box opens with the Interface tab displayed (Figure 2).

3 Click the ATM PVC tab (Figure 11).

The ATM PVC tab opens.

4 Click a PvcId entry in the table for the PVC you want to delete.

Figure 11 ATM PVC tab with a PVC selected



5 Click Delete.

The PVC is deleted.

Configuring ATM 1483 ELAN parameters

To view and configure ATM 1483 ELAN parameters for the port:

1 On the device view, highlight a port.

2 From the Device Manager menu bar, choose Edit > Port.

The Port dialog box opens with the Interface tab displayed (Figure 2).

3 Click the ATM 1483 ELAN tab.

The ATM 1483 ELAN tab opens (Figure 12).

Figure 12 ATM 1483 ELAN tab

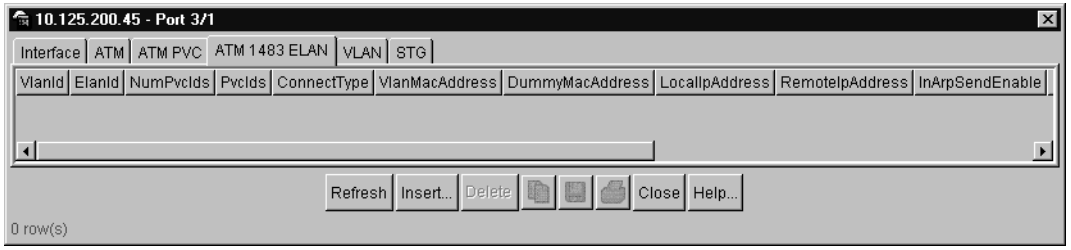


Table 11 describes the ATM 1483 ELAN tab fields.

Table 11 ATM 1483 ELAN tab fields

Field	Description
VlanId	VLAN to which the ELAN belongs.
ElanId	Internal ID of the ELAN.
NumPvcIds	Number of PVCs pairs used in the ELAN.
PvcIds	List of PVC IDs, minimum of 1 required.
ConnectType	Type of connection: bridged, IP, IPX, or muxipipx.
VlanMacAddress	MAC address assigned to this VLAN: used in IP and IPX routed circuits when there is no appropriate destination MAC to use.
DummyMacAddress	Dummy MAC address assigned to this VLAN: used in IP and IPX routed circuits when there is no appropriate source MAC to use.
LocalIpAddress	Local IP address for connection type IP.
RemoteIpAddress	Remote IP address for connection type IP.
InArpSendEnable	Enables ARP sending on the ELAN for connection type IP.
InArpSendInterval	Interval of ARP sending for connection type IP.
IpxVlanEncapMethod	One of the following: • llc • snap • ether-ii • raw
IpxNetworkNum	Network number; IPX only.
StgId	Spanning tree group ID. Only for bridge connection type.
rcStgTaggedBpduVlanId	VLAN ID used for tagging BPDUs.

4 Click Insert.

The Insert ATM 1483 ELAN dialog box opens (Figure 13).

Figure 13 Port, Insert ATM 1483 ELAN dialog box

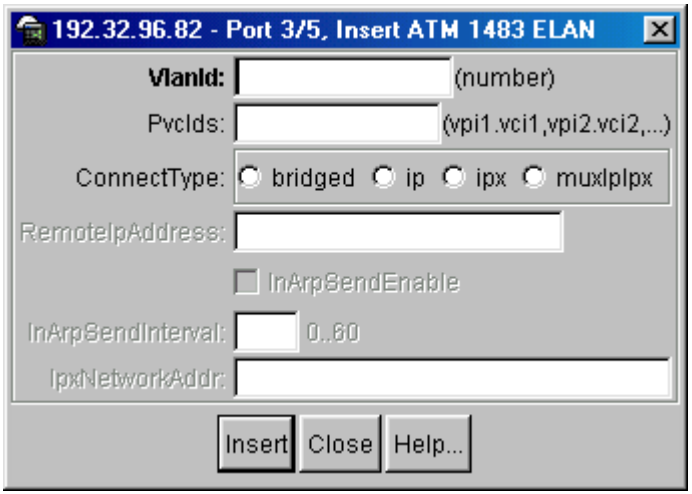


Table 12 describes the Insert ATM 1483 ELAN dialog box fields.

Table 12 Port, Insert ATM 1483 ELAN dialog box fields

Item	Description
VlanId	VLAN ID.
PvcIds	Value for Pvc IDs.
ConnectType	Types of connection: bridged, IP, IPX, or muxIpIpx.
RemoteIpAddress	IP address of the device to which you are connecting.
InArpSendEnable	Enables ARP sending on the ELAN for connection type IP.
InArpSendInterval	Interval of ARP sending for connection type IP. The range is 0 to 60 seconds.
IpxNetworkAddr	IPX network address.

5 In the VlanId field, type the VLAN ID.

6 In the PvcIds field, type the PVC ID.

Note: For <vpi.vci>, 0.0 is not supported.

7 In the ConnectType field, select the type of routing protocol: bridged, ip, ipx, or muxlplpx.

8 If bridged is selected in the ConnectType field, click Insert.

9 If Ip is selected in the ConnectType field, complete the following fields:

a In the RemoteIpAddress field, type the IP address of the device that you are connecting to in the 1483 ELAN.

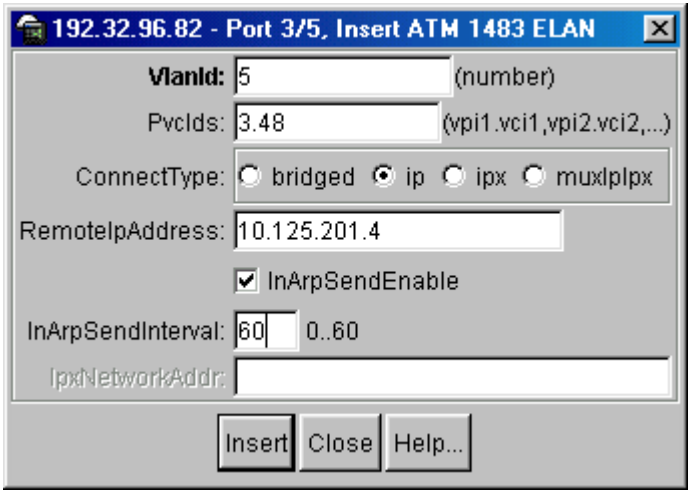
b Select the InArpSendEnable option to enable Arp packets.

c In the InArpSendInterval field, type the time interval between 0 and 60 seconds.

d Click Insert.

Figure 14 shows the relevant fields for IP routing.

Figure 14 Insert ATM 1483 ELAN dialog box for IP routing



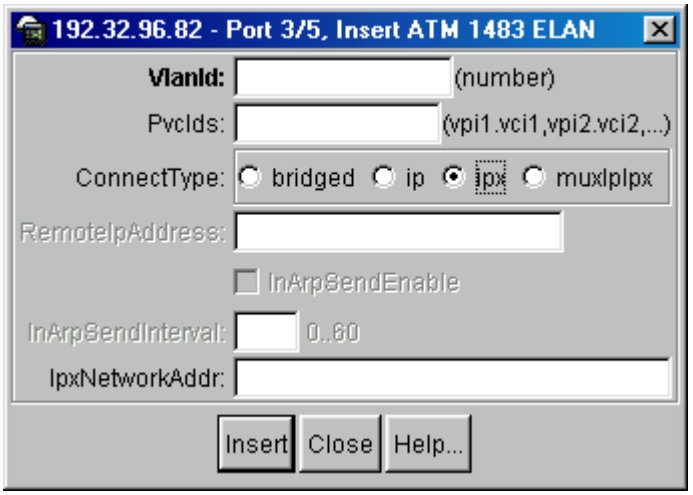
10 If Ipx is selected in the ConnectType field, complete the following fields:

a In the IpxNetworkAddr field, enter the IPX network address.

b Click Insert.

Figure 15 shows the relevant fields for IPX routing.

Figure 15 Insert ATM 1483 ELAN dialog box for IPX routing



11 If muxlplpx is selected in the ConnectType field, complete the following fields:

a In the RemoteIpAddress field, type the IP address of the device that you are connecting to in the 1483 ELAN.

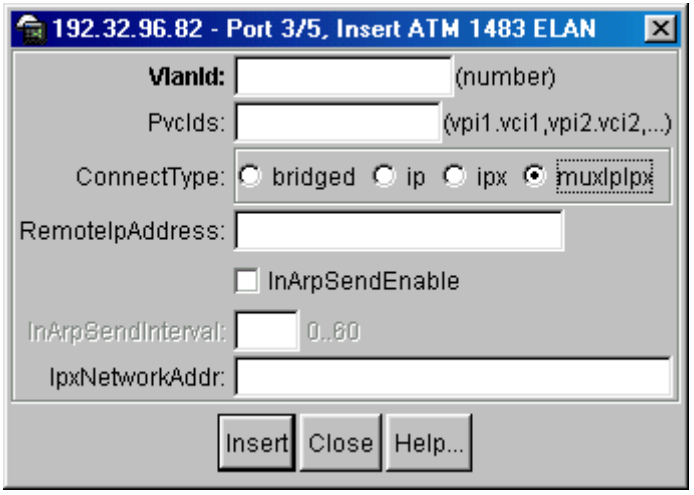
b Select the InArpSendEnable option to enable Arp packets.

a In the IpxNetworkAddr field, enter the IPX network address.

b Click Insert.

Figure 16 shows the relevant fields for muxlplpx routing.

Figure 16 Insert ATM 1483 ELAN dialog box for muxlplpx routing



Configuring ATM 1483 ELAN parameters (multiple ports)

You can also view and configure ATM 1483 ELAN parameters using the Edit > ATM menu choice. This option allows you to view all ATM 1483 ELANs in the system.

1 From the Device Manager menu bar, choose Edit > ATM.

The ATM dialog box opens with the ATM PVC tab displayed. (Figure 9 on page 55)

2 Click the ATM 1483 ELAN tab.

The Edit > ATM, ATM 1483 ELAN tab opens (Figure 17).

Figure 17 Edit > ATM, ATM 1483 ELAN tab

Table 13 describes the Edit > ATM, ATM 1483 ELAN tab fields.

Table 13 Edit > ATM, ATM 1483 ELAN tab fields

Field	Description
Port	Port Number
VlanId	VLAN to which the ELAN belongs.
ElanId	Internal ID of the ELAN.
NumPvcIds	Number of PVCs pairs used in the ELAN.
PvcIds	List of PVC IDs, minimum of 1 required.
ConnectType	Type of connection: bridged, IP, IPX, or muxIpIpx.
VlanMacAddress	MAC address assigned to this VLAN: used in IP and IPX routed circuits when there is no appropriate destination MAC to use.
DummyMacAddress	Dummy MAC address assigned to this VLAN: used in IP and IPX routed circuits when there is no appropriate source MAC to use.
LocalIpAddress	Local IP address for connection type IP.
RemoteIpAddress	Remote IP address for connection type IP.
InArpSendEnable	Enables ARP sending on the ELAN for connection type IP.
InArpSendInterval	Interval of ARP sending for connection type IP.
IpxVlanEncapMethod	One of the following: • llc • snap • ether-ii • raw
IpxNetworkNum	Network number; IPX only.
StgId	Spanning tree group ID. Only for bridge connection type.
rcStgTaggedBpduVlanId	VLAN ID used for tagging BPDUs.

3 Click Insert.

The Edit > ATM, Insert ATM 1483 ELAN dialog box opens (Figure 18).

Figure 18 Edit > ATM, Insert ATM 1483 ELAN dialog box

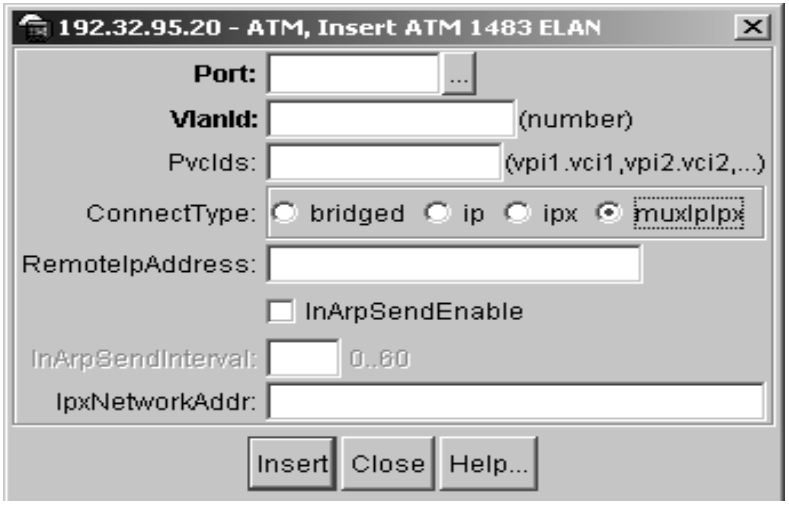


Table 14 describes the Edit > ATM, Insert ATM 1483 ELAN dialog box fields.

4

Table 14 Edit > ATM, Insert ATM 1483 ELAN dialog box fields

Item	Description
Port	Port Number
VlanId	VLAN ID.
PvcIds	Value for Pvc IDs.
ConnectType	Types of connection: bridged, IP, IPX, or muxlplpx.
RemoteIpAddress	IP address of the device to which you are connecting.
InArpSendEnable	Enables ARP sending on the ELAN for connection type IP.
InArpSendInterval	Interval of ARP sending for connection type IP. The range is 0 to 60 seconds.
IpxNetworkAddr	IPX network address.

5 In the VlanId field, type the VLAN ID.

6 In the PvcIds field, type the PVC ID.

Note: For <vpi.vci>, 0.0 is not supported.

7 In the ConnectType field, select the type of routing protocol: bridged, ip, ipx, or muxlplpx.

8 If bridged is selected in the ConnectType field, click Insert.

9 If Ip is selected in the ConnectType field, complete the following fields:

- **a** In the RemoteIpAddress field, type the IP address of the device that you are connecting to in the 1483 ELAN.
- **b** Select the InArpSendEnable option to enable Arp packets.
- **c** In the InArpSendInterval field, type the time interval between 0 and 60 seconds.
- **d** Click Insert.

10 If Ipx is selected in the ConnectType field, complete the following fields:

- **a** In the IpxNetworkAddr field, enter the IPX network address.
- **b** Click Insert.

11 If muxlplpx is selected in the ConnectType field, complete the following fields:

- **a** In the RemoteIpAddress field, type the IP address of the device that you are connecting to in the 1483 ELAN.
- **b** Select the InArpSendEnable option to enable Arp packets.
- **a** In the IpxNetworkAddr field, enter the IPX network address.
- **b** Click Insert.

Deleting an ATM 1483 ELAN

To delete an ATM 1483 ELAN:

1 On the device view, highlight a port.

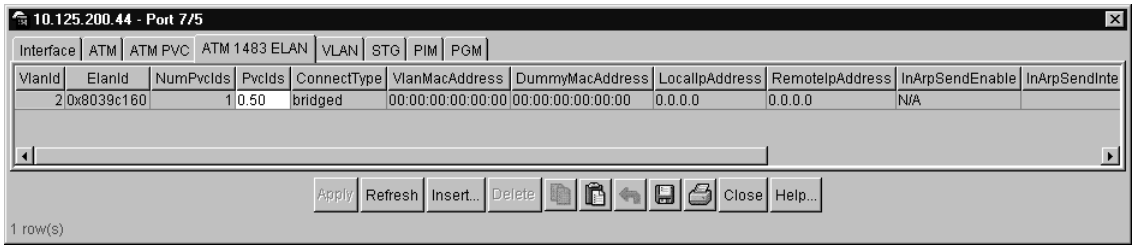
2 From the Device Manager menu bar, choose Edit > Port.

The Port dialog box opens with the Interface tab displayed (Figure 2).

3 Click the ATM 1483 ELAN tab.

The ATM 1483 ELAN tab opens (Figure 19).

Figure 19 ATM 1483 ELAN tab with ElanId selected



4 Select the ATM 1483 ELAN to be deleted by clicking the ElanId entry in the table.

Figure 19 shows a highlighted ElanId entry.

5 Click Delete.

The ATM 1483 ELAN is deleted.

Configuring ATM F5-OAM End-to-End Loopback

All 8672 ATM modules, by default, reply to received ATM F5-OAM Loopback requests. However, the transmission of F5-OAM Loopback requests and the processing of received F5-OAM Loopback replies requires you to enable this feature on a PVC-by-PVC basis. Nortel Networks recommends that you enable ATM F5-OAM on all the PVCs configured on 8672 ATM modules to allow upper layer protocols, such as MLT and OSPF, to be immediately aware of the port-down status or link-failures.

Note: You must enable the F5-OAM parameter for each PVC on the DS3 interface to properly detect far end link failures.

This section includes the following topics:

- "Enabling and defining ATM F5-OAM parameters," next
- "Displaying F5 Loopback statistics" on page 71

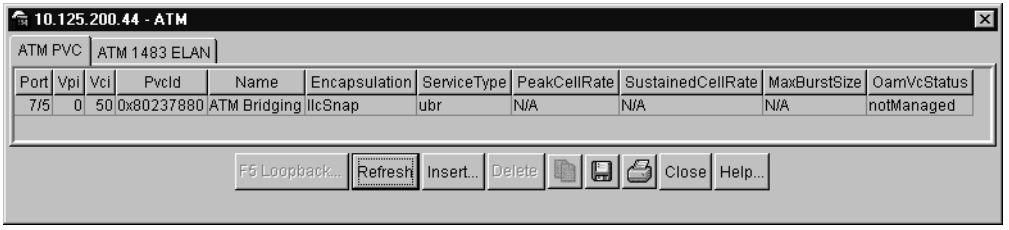
Enabling and defining ATM F5-OAM parameters

To enable and define the parameters of the ATM F5-OAM Loopback feature in Device Manager:

1 From the Device Manager menu bar choose Edit > ATM.

The ATM dialog box opens with the ATM PVC tab displayed (Figure 20).

Figure 20 ATM PVC dialog box—ATM PVC tab



2 Highlight a PVC.

3 Click F5 Loopback.

The F5 Loopback dialog box opens with the F5 Loopback tab displayed (Figure 21).

Figure 21 F5 Loopback dialog box

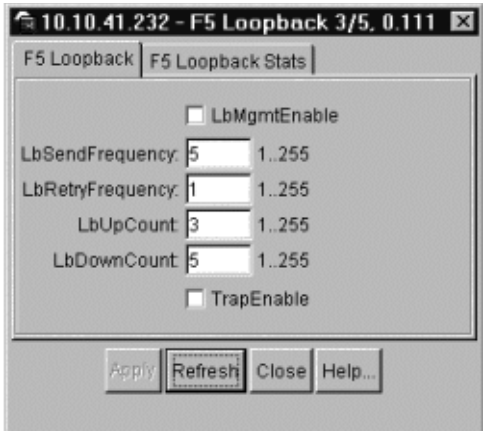


Table 15 describes the F5 Loopback tab fields.

Table 15 F5 Loopback tab field descriptions

Field	Description
LbMgmtEnable	Click to enable or disable the F5-OAM Loopback feature.
LbSendFrequency	Enter the number of seconds (1-255) between transmitting OAM loopback requests. The default value is 5 seconds.
LbRetryFrequency	Enter the number of seconds (1-255) between attempting to resend the transmission. The default value is 1 second.
LbUpCount	Enter the number of consecutive end-to-end F5-OAM loopback cell responses (1-255) that must be received in order to change a PVC connection state to up. The default value is 3 responses.
LbDownCount	Enter the number of consecutive end-to-end F5-OAM loopback cell responses (1-255) to be not received in order to change a PVC state to down. The default value is 5 responses (not received).
TrapEnable	Click to enable or disable OAM traps. When enabled, a trap is sent to the management station when OamVcStatus is going up or down.

Displaying F5 Loopback statistics

To display F5 Loopback statistics:

1. From the Device Manager menu bar choose Edit > ATM.

   The ATM dialog box opens with the ATM PVC tab displayed (Figure 8).

2. Highlight a PVC.

3. Click F5 Loopback.

   The F5 Loopback dialog box opens with the F5 Loopback tab displayed (Figure 21).

4. Click the F5 Loopback Stats tab.

   The F5 Loopback Stats tab is displayed (Figure 22).

Figure 22 F5 Loopback Stats tab

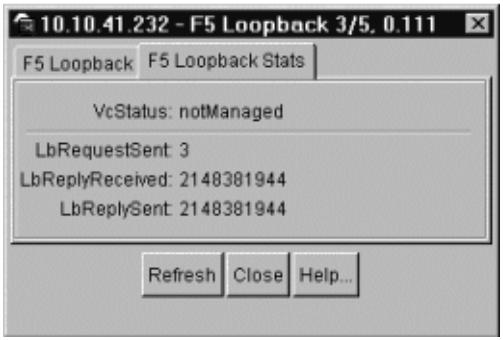


Table 16 describes the fields in the F5 Loopback Stats tab.

Table 16 F5 Loopback Stats tab fields

Field	Description
VcStatus	This field indicates the status of the PVC link. • notManaged—VC is not being managed by OAM • Down Verify—An OAM loopback failed. End-to-end F5-OAM loopback cells are sent at the specified retry frequency to verify that the VC is down. After down-count unsuccessful retries, the VC goes to the down state (see LbDownCount in Table 15). • Down—VC has not received responses to end-to-end F5-OAM loopback cells. • Up Verify—An OAM loopback was successful. End-to-end F5-OAM loopback cells are sent at the specified retry frequency to verify the VC is really up. After up-count successive and successful loopback retries, the VC goes to the Up state (see LbUpCount in Table 15). • Up—End-to-end loopbacks are successful.
LbRequestSent	Number of OAM loopback requests sent.
LbReplyReceive	Number of OAM loopback replies sent.
LbReplySent	Number of OAM loopback replies received.

Testing using Device Manager

Testing is not supported in this release.

Chapter 4
Using the CLI to configure 8672 ATM modules

Two management tools enable you to configure your 8672 ATM modules: Device Manager and the command line interface (CLI). This chapter describes how to configure your 8672 ATM modules using the CLI.

Chapter 5, “Configuration examples,” on page 133 provides typical configuration examples that you can refer to when configuring your 8672 ATM modules.

You can also use the embedded Web-based management feature to monitor 8672 ATM modules (see Chapter 6, “Web Management,” on page 167).

This chapter includes the following topics:

Configuration commands

This section describes the CLI configuration commands available with the 8672 ATM modules. There are three types of configuration commands:

Note: If you replace one card with another type of card, Nortel Networks recommends that you go to the root level of the CLI directory before using any CLI commands.

Module commands

The module commands allow you to:

- Reset the module
- View ELAN statistics
- Display the image filename for the 8672 ATM modules.

The syntax is:

`config atmcard <atmslot number>`

The required variable `<atmslot number>` is the slot number of the module in the Passport 8600 chassis. Table 17 describes the parameters and variables for the `config atmcard` command.

Table 17 config atmcard command parameters and variables

Parameters and variables	Description
`card-reset`	Resets the card.
`elan-stats <enable|disable>`	Enables collection of ELAN statistics.
`info`	Displays the image filename for the module.

1483 ELAN statistics commands

The 1483 ELAN statistics commands allow you to collect ELAN statistics for an ATM port. The commands are:

- `config atmcard <slot_number> elan-stats <enable|disable>`
- `clear atm elan-stats` <*vlan_id*>
- `show atm elan-stats` <*vlan_id*>

Enabling or disabling ATM ELAN statistics

The collection of ELAN statistics is disabled by default to avoid slowing data forwarding performance. ELAN statistics should be disabled after collection.

To enable ATM ELAN statistics, use the following command:

```
config atmcard <slot_number> elan-stats enable
```

To disable ATM ELAN statistics, use the following command:

```
config atmcard <slot_number> elan-stats disable
```

Enabling or disabling the collection of ELAN statistics does not clear the ELAN statistics counters. This allows the ELAN statistics to be reviewed after the feature is disabled.

Clearing ATM ELAN statistics for a VLAN ID

To clear ATM ELAN statistics for a particular VLAN ID, use the following command:

```
clear atm elan-stats <vlan_id>
```

Showing ATM ELAN statistics

To display ATM ELAN statistics for a particular VLAN ID, use the following command:

```
show atm elan-stats <vlan_id>
```

If the collection of ELAN statistics is disabled, a message is printed before the ELAN statistics.

Figure 23 shows sample output for this command.

Figure 23 show atm elan-stats command output

```
 Passport-8610:5# show atm elan-stats 7
=============================================================================
                            ATM ELAN STATISTICS
=============================================================================
InOctets:          3208404820   InErrors:          0   InDiscards:          0
OutOctets:          3208281916  OutErrors:          0  OutDiscards:         0
 InUcastPkts:     130202   InMcastPkts:        395   InBCastPkts:   59134772
OutUcastPkts:     129406  OutMcastPkts:        391  OutBCastPkts:   59133296
```

Table 18 describes the ATM ELAN statistics parameters.

Table 18 show atm elan-stats parameters

Field	Description
InOctets	Octets received from the ATM interface. This includes the InDiscards PDUs.
OutOctets	Octets transmitted out of the ATM interface. **NOTE**: For a Bridge ELAN Type with multiple PVCs, there will be multiple packets transmitted for a multicast packet, or for a unicast packet that is not in the CAM. Thus, the OutOctets may not correlate to the OutUcastPkts + OutMcastPkts + OutBcastPkts.
InErrors	AAL5 CPCS PDUs received with errors from the ATM interface. These errors include CRC-32 errors, SAR time-out errors, and oversized SDU errors.
OutErrors	Number of AAL5 CPCS PDUs that could not be transmitted due to error.
InDiscards	Number of received Ethernet packets discarded due to errors.
OutDiscards	Number of transmitted Ethernet packets discarded due to errors.
InUcastPkts	Number of unicast packets received on the ELAN.
OutUcastPkts	Number of unicast packets transmitted on the ELAN.
InMcastPkts	Number of Multicast packets received on the ELAN.
OutMcastPkts	Number of Multicast packets transmitted on the ELAN.
InBcastPkts	Number of broadcast packets received on the ELAN.
OutBcastPkts	Number of broadcast packets transmitted on the ELAN.

Port commands

The port commands allow you to perform general configuration on the 8672 ATM modules. The port commands are:

- `config atm <ports>`
- `config atm <ports> pvc`
- `config atm <ports> pvc 1483 {bridged|ip|ipx|muxIpIpx}`
- `config atm <ports> info`

Configuring ATM ports

To configure ATM ports options, use the following command:

`config atm <ports>`

This command includes the following parameters:

config atm <ports> followed by:	
info	Displays the last saved port settings and the next-level CLI commands. Note that this does not show the current settings, but the last saved settings (Figure 24).
action <action choice>	Flushes a MAC, ARP, or IP table or triggers a RIP update. Choices are: • none • flushMacFdb • flushArp • flushIp • flushAll • triggerRipUpdate

config atm <ports> followed by:	
number-vpi-bits <number-vpi-bits>	• set vpi bits used in ATM: DS3 {1..7}, OC3 {1..6}, OC12 {1..8} • Sets the number of bits used to represent VPI. Enter integer from 0 to 8. • For OC-3c, 11 bits split between NumVpiBits and NumVciBits. NumVpiBits cannot exceed 6 bits for OC-3c. • For OC-12c, 13 bits split between NumVpiBits (default is 4) and NumVciBits (default is 9). NumVpiBits cannot exceed 8 bits for OC-12c. • For DS-3, 12 bits split between NumVpiBits (default is 4) and NumVciBits (default is 8). NumVpiBitscannot exceed 7bits for DS-3.
scrambling <*enable* | *disable*>	Enables or disables scrambling.
framing-mode <*sonet* |*sdh*|*ds3CbitAdm*| *ds3CbitPlcp*|*ds3M23Adm*| *ds3M23Plcp*>	Sets the framing to: • *sonet* (Synchronous Optical Network), the standard format used in North America. • *sdh* (Synchronous Digital Hierarchy), the standard format used worldwide except in North America. • Any of the following Digital Signal, Level 3 (DS-3) formats: — *ds3CbitAdm* — *ds3CbitPlcp* — *ds3M23Adm* — *ds3M23Plcp*
clock-source <*loop-timed* | *free-running*>	Sets the transmit clock source to: • l*oop-timed*, which means clocking is derived from line. • *free-running*, which means clocking is derived from on-board clock. Note that if you have two connected 8672 ATM moduless, you must set both to free-running or one to loop-timed and one to free-running; do not set both to loop-timed.
loop-back-mode <*off* | *internal* | external>	Sets the loopback mode to: • *off* • *internal* • *external* • *ds3PayloadLoop* • *ds3DiagLoop* • *ds3LineLoop*

config atm <ports> followed by:	
name <*name*>	Sets the port name. • *name* is a string length in the range 0 to 20 alphanumeric characters.
state <*enable* | *disable*>	Sets the state of the port to enabled or disabled.

Configuring ATM PVC

To configure PVC for ATM, use the following command:

```
config atm <ports> pvc
```

This command includes the following parameters:

config atm <ports>pvc followed by:	
info [<*ports*>]	Displays PVC info command output (Figure 29).

create < *vpi.vc*i> [*name* <*value*>] [*enc* <*value*>] [*serv* <*value*>] [*pcr* <*value*>] [*scr* <*value*>] [*mbs* <*value*>]	Creates a PVC. The required parameters are: • *vpi* is the circuit VPI. Enter a numeric value, within the range. • *vci* is the circuit VCI. Enter a numeric value, within the range. For OC-3c, 11 bits split between Vpi and Vci. Vpi bits cannot exceed 6 bits for OC-3c. For OC-12c, 13 bits split between Vpi (default is 4) and Vci (default is 9). Vpi bits cannot exceed 8 bits for OC-12c. For DS-3, 12 bits split between Vpi (default is 4) and Vci (default is 8). VpiBits cannot exceed 7bits for DS-3. Note: For <vpi.vci>, 0.0 is not supported. The optional parameters are: • *name* is the display string. Enter up to 256 alphanumeric characters to name PVC. • *enc* is the 1483 encapsulation method, either null or llc-snap. • *serv* is the bit rate, either ubr or vbr. • *pcr*, with VBR only, is the peak cell rate. The valid ranges are: OC-3—86..353207 OC-12—86..733490 DS-3—86..96000 • *scr*, with VBR only, is the sustained cell rate. The valid ranges are: OC-3—86..353207 OC-12—86..733490 DS-3—86..96000 • *mbs*, with VBR only, is the maximum burst size. Enter an integer from 2 to 255. Note that no VLANs or ELANs are bound to this PVC until you add VLAN membership using the config atm <ports> pvc 1483 commands.
delete <*vpi.vc*i>	Deletes the specified PVC. Note that this command will fail if the PVC is still being used by RFC 1483 traffic.

Configuring 1483 parameters

To configure 1483 parameters on the 8672 ATM modules, use the following commands:

```
config atm <ports> pvc 1483 bridged
config atm <ports> pvc 1483 ip
config atm <ports> pvc 1483 ipx
config atm <ports> pvc 1483 muxIpIpx
```

The bridged command includes the following parameters:

config atm <ports> pvc 1483 bridged followed by:	
info	Displays information on 1483 ELANs (Figure 30).
add <*vid*> <*vpi.vci*> [,<*vpi.vci*>]	Adds a number of PVCs to the specified 1483 ELAN. The required parameters are: • *vid* is the VLAN ID number. • *vpi.vci* s the circuit VPI number and the circuit VCI numbers, respectively; they are separated by a period. Note: This command fails if the specified VIDs or VPI/VCI pairs belong to another ELAN or already exist on this ELAN.
create <*vid*> <*vpi.vc*i> [,<*vpi.vci*>]...	Creates a 1483 ELAN consisting of the specified PVCs. The required parameters are: • *vid* is the VLAN ID number. • *vpi.vci* is the circuit VPI number and the circuit VCI numbers, respectively; they are separated by a period. Note: This command fails if the specified VIDs or VPI/VCI pairs belong to another ELAN or already exist on this ELAN.
delete <*vid*>	Deletes the specified ELAN.
remove <*vid*> <*vpi.vci*> [,<*vpi.vc*i>]...	Removes a number of PVCs from the specified 1483 ELAN. The required parameters are: • *vid* is the VLAN ID number. • vpi.vci is the circuit VPI number and the circuit VCI numbers, respectively; they are separated by a period. Note that this command fails if the PVCs are not present.

config atm <ports> pvc 1483 ip followed by:	
info	Displays information on routed 1483 IP circuits.
create <*vid*> <*vpi.vci*> <*remoteip*>	Creates a routed 1483 IP circuit on the specified VLAN to the specified remote router interface. The required parameters are: • *vid* is the VLAN ID number. • *vpi.vci* is the circuit VPI number and the circuit VCI numbers, respectively; they are separated by a period. • *remoteip* is the IP address of the remote router interface. Note that the VLAN ID can exist *only* on this port.
delete <*vid*>	Deletes the routed 1483 IP circuit on the specified VLAN.

config atm <ports> pvc 1483 ipx followed by:	
info	Displays information on routed 1483 IPX circuits.
create <*vid*> <*vpi.vci*> <*ipx*>	Creates a routed 1483 IPX circuit on the specified VLAN to the specified remote router interface. The required parameters are: • *vid* is the VLAN ID number. • *vpi.vci* is the circuit VPI number and the circuit VCI numbers, respectively; they are separated by a period. • *ipx* is the IPX Network address of the remote router interface. If this address is not configured, the first IPX Network address configured for the specified VLAN is used. Note that the VLAN ID must be previously configured for IPX on this port. No ARP functionality is available on this IPX segment.
delete <*vid*>	Deletes the routed 1483 IPX circuit on the specified VLAN.

config atm <ports> pvc 1483 muxIpIpx followed by:	
info	Displays the muxIpIpx ELAN information. (Figure 24)
create <*vci*> <*vpi.vci* > <remoteip> [<*ipx* >] [<InArpSend enable | disable>] [<arp send rate>]	Creates an IPX muxIpIpx ELAN where: • < *vid* > is the VLAN id. • <*vpi.vci* > specifies a Vpi and Vci value. The ranges are (0 to 255. 0-4095) • < *remoteip* > specifies the remote IP address. • <*ipx* > is the IPX network number {0x00:0x00:0x00:0x00:0x00}. Optional parameter. • <*InArpSend enable* | *disable*> enable or disable ARP send. • <*arp send rate*> specifies the arp send rate.
delete <*vid* >	Deletes the mulipipx ELAN. • <*vid* > is the VLAN id.

Figure 24 shows sample output for the **`config atm <ports> pvc 1483 muxIpIpx info`** command.

Figure 24 config atm <ports> pvc 1483 muxIpIpx info command output

```
8610:5/config/atm/7/5/pvc/1483/muxIpIpx# create 1 0.33
128.125.9.3 0x00000012

8610:5/config/atm/7/5/pvc/1483/muxIpIpx# info

Sub-Context:
Current Context:

Port 7/5:
               1483 muxIpIpx
                      VlanId : 1
                     Vpi.Vci : 0.33
              Remote IP Addr : 128.125.9.3
              IPX Net Number : 0x12
              Dummy MAC Addr : 00:e0:ff:7b:8a:3c
```

Note: The Dummy MAC Address is used as a source MAC address when an ARP response is sent

Showing ATM configuration information

To display ATM information, use the following command:

```
config atm <ports> info
```

Figure 25 shows sample output for this command.

Figure 25 config atm info command output

```
Passport-8610:5# config atm 3/5 info

Sub-Context: clear config dump monitor show test trace wsm
Current Context:

Port 3/5 :
                        Name :
             number-vpi-bits : 4
                  scrambling : Enable
               framing-mode : ds3CbitPlcp
               clock-source : Free Running
              loop-back-mode : off
                       state : up
```

Show commands

This section discusses the CLI show commands available with the 8672 ATM modules. These commands allow you to view information about the module:

```
show ports info atm all [<ports>]
show ports info atm fdb
show ports info atm ports [<ports>]
show ports info atm pvc [<ports>]
show ports info atm 1483 [<ports>]
show ports stats atmport [<ports>]
show ports stats atm ds3fecurrent [<ports>]
show ports stats atm ds3feinterval <intervalid> [<ports>]
show ports stats atm ds3fetotal [<ports>]
show ports stats atm ds3necurrent [<ports>]
show ports stats atm ds3neinterval <intervalid> [<ports>]
show ports stats atm ds3netotal [<ports>]
show ports stats atm felinecurrent [<ports>]
show ports stats atm felineinterval <intervalid> [<ports>]
show ports stats atm fepathcurrent [<ports>]
show ports stats atm fepathinterval <intervalid> [<ports>]
show ports stats atm linecurrent [<ports>]
show ports stats atm lineinterval <intervalid> [<ports>]
show ports stats atm pathcurrent [<ports>]
show ports stats atm pathinterval <intervalid> [<ports>]
show ports stats atm sectioncurrent [<ports>]
show ports stats atm sectioninterval <intervalid> [<ports>]
show ports stats atm sonetmediumtbl [<ports>]
```

Showing ATM configuration information for all ports

To display configuration information for ATM ports, use the following command:

```
show ports info atm all [<ports>]
```

Figure 26 shows sample output for this command.

Figure 26 show ports info atm all command output

```
Passport-8610:5# show ports info atm all 3/5
                                    ATM Port Configuration
================================================================================
PORT     MDA        SCRAMBLE   FRAMING  MAX-BITS CLOCK  LOOPBACK ADMIN
NUM   DESCRIPION    ENABLE     MODE    VPI VCI  SOURCE   MODE   STATE   STATUS
--------------------------------------------------------------------------------
3/5   Dual DS3 MDA  enable  ds3CbitPlcp 4  8    free   off      up      down
================================================================================
                                        ATM PVC
================================================================================
PORT    PVC             SERVICE   F5     OAM    SEND   RETRY    UP    DOWN
NUM   VPI.VCI   ENCAPS   TYPE    OAM    TRAP   FREQ    FREQ   COUNT  COUNT
--------------------------------------------------------------------------------
3/5   2.50      llc-snap  VBR  enable   disable  5      1      3      5
================================================================================
                                        ATM PVC F5 Status & Statistics
================================================================================
PORT    PVC        F5 VC     LOOPBACK    LOOPBACK   LOOPBACK
NUM   VPI.VCI      STATUS    REQ SENT   REPLY RCV  REPLY SENT
--------------------------------------------------------------------------------
3/5   2.50         down        0           0          0
================================================================================
                                        ATM ON BOARD CAM ENTRY
================================================================================
PORT  VLAN      MAC                 PVC        AGE
NUM    ID     ADDRESS            VPI.VCI      TIME
--------------------------------------------------------------------------------
================================================================================
                                        1483 Bridged
================================================================================
PORT  VLAN    PVC
NUM    ID     LIST
================================================================================
                                        1483 IP
================================================================================
PORT  VLAN      PVC        VLAN           LOCAL          REMOTE
NUM    ID     VPI.VCI   MAC ADDRESS       IP ADDRESS     IP ADDRESS
--------------------------------------------------------------------------------
================================================================================
                                        1483 IPX
================================================================================
PORT  VLAN      PVC        VLAN           IPX NETWORK  IPX
NUM    ID     VPI.VCI   MAC ADDRESS         NUMBER     ENCAP
--------------------------------------------------------------------------------
================================================================================
```

Table 19 describes the ATM port configuration parameters.

Table 19 show ports info atm all parameters

Field	Description
PORT NUM	Port number.
MDA DESCRIPTION	This field describes the MDA: • Quad OC-3c SM — quad port OC-3c single-mode fiber • Quad OC-3c MM — quad port OC-3c multimode fiber • OC-12c SM — single port OC-12c single-mode fiber • OC-12c MM — single port OC-12c multimode fiber • Dual DS-3 MDA — dual port DS-3
SCRAMBLE ENABLE	Parameter that enables/disables the scrambling option.
FRAMING MODE	Indicates the framing for the port, either: • *sonet* (Synchronous Optical Network), the standard format used in North America. • *sdh* (Synchronous Digital Hierarchy), the standard format used worldwide except in North America. • Any of the following Digital Signal, Level 3 (DS-3) formats: — *ds3CbitAdm* — *ds3CbitPlcp* — *ds3M23Adm* — *ds3M23Plcp*
MAX-BITS VPI	For OC-3c, 11 bits split between NumVpiBits and NumVciBits. NumVpiBits cannot exceed 6 bits for OC-3c. For OC-12c, 13 bits split between NumVpiBits (default is 4) and NumVciBits (default is 9). NumVpiBits cannot exceed 8 bits for OC-12c. For DS-3, 12 bits split between NumVpiBits (default is 4) and NumVciBits (Default is 8). NumVpiBits cannot exceed 7 bits for DS-3.
MAX-BITS VCI	This field is read only. It takes remaining bits from NumVpiBits. For example, if NumVpiBits is 3 for OC-3c, then NumVciBits is 8.
CLOCK SOURCE	Indicates whether the Clock Source is either: • loop - Loop Timed, clocking derived from line signal • free - Free Running, clocking derived from internal clock

Table 19 show ports info atm all parameters (continued)

Field	Description
LOOPBACK MODE	Indicates the loopback mode:: • *off* • *internal* • *external* • *ds3PayloadLoop* • *ds3DiagLoop* • *ds3LineLoop*
ADMIN STATE	Indicates the Admin State of the port, either: • up • down
STATUS	Indicates the status of the port, either: • up • down
PVC VPI.VCI	Permanent virtual circuit and the associated vpi and vci numeric identifiers.
ENCAPS	Encapsulation methods: either null, or llc-snap.
SERVICE TYPE	Unspecified bit rate (ubr) or variable bit rate (vbr).
VLAN ID	VLAN name to which the ELAN belongs.
PVC LIST	List of permanent virtual circuits.
VLAN MAC ADDRESS	The MAC address assigned to this VLAN (used in IP and IPX routed circuits when there is no appropriate destination MAC to use).
LOCAL IP ADDRESS	The local Ip address for connection type IP.
REMOTE IP ADDRESS	The remote Ip address for connection type IP.
IPX NETWORK NUMBER	Network number. (IPX network address)
IPX ENCAP	Encapsulation method: llc, snap, ether-ii or raw.

Showing FDB information for the 1483 bridged point to multi-point PVCs

To display information about the Forwarding Data Base (FDB) for the 1483 bridged point to multi-point PVCs, use the following command:

```
show ports info atm fdb
```

The FDB stores the information that it learns in the 8672 ATM modules.

In a point to multi-point connection, the 8672 ATM modules uses the FDB table to determine which PVC to use in the egress direction.

Figure 27 shows sample output for this command.

Figure 27 show ports info atm fdb command output

```
Passport-8610:5/show/ports/info/atm# fdb
================================================================
                        ATM ON BOARD CAM ENTRY
================================================================
PORT        VLAN          VLAN                PVC             AGE
NUM         ID         MAC ADDRESS          VPI.VCI          TIME
----------------------------------------------------------------------
3/1         2          00.00.00.00.03       0.100            5
```

Table 20 describes the ATM forwarding database parameters.

Table 20 show ports info atm fdb parameters

Field	Description
PORT NUM	Port number.
VLAN ID	VLAN number.
VLAN MAC ADDRESS	The destination MAC address.
PVC VPI.VCI	Permanent virtual circuit and the associated vpi and vci numeric identifiers.
AGE TIME	The time that elapsed since the MAC address was last used.

Showing ATM port configuration information

To display information about the configuration of ATM ports, use the following command:

```
show ports info atm ports
```

Figure 28 shows sample output for this command.

Figure 28 show ports info atm ports command output

```
Passport-8610:5# show ports info atm ports

================================================================================
                                    ATM Port Configuration
================================================================================
PORT     MDA         SCRAMBLE   FRAMING   MAX-BITS CLOCK  LOOPBACK ADMIN
NUM   DESCRIPION     ENABLE     MODE     VPI VCI  SOURCE   MODE   STATE   STATUS
--------------------------------------------------------------------------------
3/1   Quad OC-3c MM enable  sonet       4  7    free   off      up      down
3/2   Quad OC-3c MM enable  sonet       4  7    free   off      up      down
3/3   Quad OC-3c MM enable  sonet       4  7    free   off      up      down
3/4   Quad OC-3c MM enable  sonet       4  7    free   off      up      down
3/5   Dual DS3 MDA  enable  ds3CbitPlcp 4  8    free   off      up      down
3/6   Dual DS3 MDA  enable  ds3CbitPlcp 4  8    free   off      up      down
```

Table 21 describes the ATM port configuration parameters.

Table 21 show ports info atm ports parameters

Field	Description
PORT NUM	Port number.
MDA DESCRIPTION	This field describes the MDA types: • Quad OC-3c SM — dual port OC-3c single-mode fiber • Quad OC-3c MM — dual port OC-3c multimode fiber • OC-12c SM — single port OC-12c single-mode fiber • OC-12c MM — single port OC-12c multimode fiber • Dual DS3 MDA
SCRAMBLE ENABLE	Parameter that enables/disables the scrambling option.

Table 21 show ports info atm ports parameters

Field	Description
FRAMING MODE	Indicates the framing for the port, either: • *sonet* (Synchronous Optical Network), the standard format used in North America. • *sdh* (Synchronous Digital Hierarchy), the standard format used worldwide except in North America. • Any of the following Digital Signal, Level 3 (DS-3) formats: — *ds3CbitAdm* — *ds3CbitPlcp* — *ds3M23Adm* — *ds3M23Plcp*
MAX-BITS VPI	For OC-3c, 11 bits split between NumVpiBits and NumVciBits. NumVpiBits cannot exceed 6 bits for OC-3c. For OC-12c, 13 bits split between NumVpiBits (default is 4) and NumVciBits (default is 9). NumVpiBits cannot exceed 8 bits for OC-12c. For DS-3, 12 bits split between NumVpiBits (default is 4) and NumVciBits (default is 8). NumVpiBitscannot exceed 7bits for DS-3.
MAX-BITS VCI	This field is read only. It takes remaining bits from NumVpiBits. For example, if NumVpiBits is 3 for OC-3c, then NumVciBits is 8.
CLOCK SOURCE	Indicates whether the Clock Source is either: • line • internal
LOOPBACK MODE	Indicates the loopback mode: • *off* • *internal* • *external* • *ds3PayloadLoop* • *ds3DiagLoop* • *ds3LineLoop*
ADMIN STATE	Indicates the Admin State of the port, either: • up • down
STATUS	Indicates the status of the port, either: • up • down

Showing PVC information for specified ports

To display information about the permanent virtual circuits (PVCs) for the specified port or for all ports, use the following command:

```
show ports info atm pvc [<ports>]
```

Figure 29 shows sample output for this command.

Figure 29 show ports info atm pvc command output

```
Passport-8610:5/show/ports/info/atm# pvc
=========================================================================
                                    ATM PVC
=========================================================================
PORT     PVC              SERVICE    F5     OAM     SEND  RETRY   UP    DOWN
NUM    VPI.VCI   ENCAPS     TYPE     OAM    TRAP    FREQ  FREQ   COUNT  COUNT
-------------------------------------------------------------------------
3/1    0.100     llc-snap     UBR    disable  disable   5     1      3      5
3/1    3.200     llc-snap     UBR    enable   disable   5     1      3      5
3/6    0.33      llc-snap     UBR    disable  disable   5     1      3      5
3/6    3.90      llc-snap     UBR    enable   disable   10    3      3      5
3/8    3.40      llc-snap     UBR    enable   enable    5     2      5      5
3/8    4.50      llc-snap     UBR    disable  disable   5     1      3      5
3/8    7.100     llc-snap     UBR    disable  disable   5     1      3      5

Passport-8610:5/show/ports/info/atm#
```

Table 22 describes the ATM PVC parameters.

Table 22 show ports info atm pvc parameters

Field	Description
PORT NUM	Port number.
PVC VPI.VCI	Permanent virtual circuit and the associated vpi and vci numeric identifiers.
ENCAPS	Encapsulation method: null or llc-snap.
SERVICE TYPE	Unspecified bit rate (ubr) or variable bit rate (vbr).
F5 OAM	Status of F5-OAM Loopback feature: enable or disable.
OAM TRAP	Status of the SNMP Trap when the F5-OAM Loopback changes from the DOWN VERIFY to DOWN state or from the UP VERIFY to UP state: enable or disable.

Table 22 show ports info atm pvc parameters (continued)

Field	Description
SEND FREQ	Transmission rate (in seconds) of F5-OAM Loopback requests.
RETRY FREQ	Retry-transmission rate (in seconds) of F5-OAM Loopback requests.
UP COUNT	Number of consecutive F5-OAM Loopback replies that must be received to change the Loopback State to “up.”
DOWN COUNT	Number of consecutive F5-OAM Loopback replies that must fail to change the Loopback State to “down.”

Showing 1483 circuit information for ports

To display information about 1483 circuits for the specified port or for all ports, use the following command:

```
show ports info atm 1483 [<ports>]
```

Figure 30 shows sample output for this command.

Figure 30 show ports info atm 1483 command output

```
Passport-8610:5# show ports info atm 1483 3/5

================================================================================
                                        1483 Bridged
================================================================================
PORT  VLAN    PVC
NUM    ID     LIST
--------------------------------------------------------------------------------


================================================================================
                                        1483 IP
================================================================================
PORT  VLAN      PVC         VLAN           LOCAL          REMOTE
NUM    ID     VPI.VCI   MAC ADDRESS       IP ADDRESS     IP ADDRESS
--------------------------------------------------------------------------------


================================================================================
                                        1483 IPX
================================================================================
PORT  VLAN      PVC         VLAN           IPX NETWORK  IPX
NUM    ID     VPI.VCI   MAC ADDRESS         NUMBER     ENCAP
--------------------------------------------------------------------------------


================================================================================
                                        1483 MUX IP & IPX
================================================================================
PORT  VLAN     PVC         VLAN             REMOTE       IPX NETWORK  IPX
NUM    ID     VPI.VCI   MAC ADDRESS       IP ADDRESS       NUMBER    ENCAP
--------------------------------------------------------------------------------
```

Table 23 describes the 1483 circuit parameters.

Table 23 show ports info atm 1483 parameters

Field	Description
PORT NUM	Port number.
VLAN ID	VLAN name to which the ELAN belongs.
PVC LIST	List of permanent virtual circuits.

Table 23 show ports info atm 1483 parameters

Field	Description
VLAN MAC ADDRESS	MAC address assigned to this VLAN: used in IP and IPX routed circuits when there is no appropriate destination MAC to use.
LOCAL IP ADDRESS	Local IP address for connection type IP.
REMOTE IP ADDRESS	Remote IP address for connection type IP.
IPX NETWORK NUMBER	IPX network address
IPX ENCAP	Encapsulation method: llc, snap, ether-ii, or raw.

Showing ATM port statistics

To display statistics for atm ports, use the following command:

```
show ports stats atmport [<ports>]
```

Figure 31 shows sample output for this command.

Figure 31 show ports stats atmport [<ports>] command output

```
Passport-8606:6/show/ports/stats# atmport
================================================================================
                          ATM Port Statistics I
================================================================================
PORT      IN        OUT        IN CORR    IN UNCORR
NUM       CELLS     CELLS      HCS ERR     HCS ERR
--------------------------------------------------------------------------------
3/1       0         6744908     0          0
3/2       0         6744901     0          0
3/3       0         6744893     0          0
3/4       0         6744888     0          0
3/5       0         35314189    0          0
================================================================================
                                       ATM Port Statistics II
================================================================================
PORT    IN      OUT     IN DROP     OUT DROP   UNKNOWN VPI/VCI      IDLE
NUM     PKTS    PKTS     PKTS        PKTS         CELLS            CELLS
--------------------------------------------------------------------------------
3/1      0       0        0           0           0               6746913
3/2      0       0        0           0           0               6746912
3/3      0       0        0           0           0               6746913
3/4      0       0        0           0           0               8096349
3/5      0       0        0           0           0              42386582

Passport-8606:6/show/ports/stats#
```

Table 24 describes the ATM port parameters.

Table 24 show ports stats atmport parameters

Field	Description
PORT NUM	Port number.
IN CELLS	Received cells.
OUT CELLS	Transmitted cells.
IN CORR HCS ERR	Number of received cells in which the Header CheckSum (HCS) error was corrected.
IN UNCORR HCS ERR	Number of received cells dropped because the HCS could not be corrected.
IN PKTS	Number of packets received.
OUT PKTS	Number of packets transmitted.

Table 24 show ports stats atmport parameters

Field	Description
IN DROP PKTS	Number of in-bound packets dropped.
OUT DROP PKTS	Number of out-bound packets dropped.
UNKNOWN VPI/VCI CELLS	Number of packets for which the vpi/vci values are unknown.
IDLE CELLS	Cells that are inactive.

Showing ATM DS3 far end current statistics

To display DS3 far end current statistics, use the following command:

```
show ports stats atm ds3fecurrent [<ports>]
```

where:

- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 32 shows sample output for this command.

Figure 32 show ports stats atm ds3fecurrent command output

```
Passport-8610:5# show ports stats atm ds3fecurrent

================================================================================
                          ATM Ds3 Far End Current Statistics I
================================================================================
PORT  TIME       VALID       ERRORED SECONDS    SEVERELY ERRORED
NUM   ELAPSED    INTERVAL    COUNT(C-BIT CES)   COUNT(C-BIT SES)
--------------------------------------------------------------------------------
3/5     410          68               410               410
3/6     410          68               410               410


================================================================================
                          ATM Ds3 Far End Current Statistics II
================================================================================
PORT  CODE VIOLATION         UNAVAILABLE        INVALID
NUM   COUNT (CCV)            SECONDS(UAS)       INTERVAL
--------------------------------------------------------------------------------
3/5    126177280                   0               0
3/6    128148800                   0               0
```

Table 25 describes the DS3 far end current parameters.

Table 25 show ports stats atm ds3fecurrent parameters

Field	Description
PORT NUM	Port number.
TIME ELAPSED	Time since last interval update
VALID INTERVAL	The number of previous far-end intervals for which data was collected. The value will be 96 unless the interface was brought online within the last 24 hours, in which case the value will be the number of complete 15 minute far-end intervals since the interface was brought online.
ERRORED SECONDS COUNT (C-BIT CES)	C-Bit Errored Second (CES) is a single second with one or more C-Bit coding violations (CCV), or one or more Out of Frame, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
SEVERELY ERRORED COUNT (C-BIT SES)	C-Bit Severely Errored Second (CSES) is a single second with 44 or more CCVs, or one or more Out of Frame defects, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.

Table 25 show ports stats atm ds3fecurrent parameters (continued)

Field	Description
CODE VIOLATION COUNT (CCV)	C-Bit Coding Violation (CCV) is an error event for C-bit Parity and SYNTRAN DS3 applications.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
INVALID INTERVAL	Count of intervals for which data is not available for some reason. Typically will be zero (0).

Showing ATM DS3 far end interval statistics

To display DS3 far end interval statistics, use the following command:

`show ports stats atm ds3feinterval <intervalid> [<ports>]`

where:

- *intervalid* is the interval identifier
- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 33 shows sample output for this command.

Figure 33 show ports stats atm ds3feinterval command output

```
Passport-8610:5# show ports stats atm ds3feinterval 10

================================================================================
                                        ATM Far End Ds3 Interval Stats
================================================================================
PORT    ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION   UNAVAILABLE
NUM     COUNT (CES)      COUNT (CSES)      COUNT (CCV-L)    SECONDS (UAS)
--------------------------------------------------------------------------------
3/5      0                0                 0                900
3/6      0                0                 0                900
INTERVAL ID = 10
```

Table 26 describes the DS3 far end interval parameters.

Table 26 show ports stats atm ds3feinterval parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (CES)	C-Bit Errored Second (CES) is a single second with one or more C-Bit coding violations (CCV), or one or more Out of Frame, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
SEVERELY ERRORED COUNT (CSES)	C-Bit Severely Errored Second (CSES) is a single second with 44 or more CCVs, or one or more Out of Frame defects, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
CODE VIOLATION COUNT (CCV-L)	C-Bit Coding Violation (CCV) is an error event for C-bit Parity and SYNTRAN DS3 applications.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.

Showing ATM DS3 far end total statistics

To display DS3 far end total statistics, use the following command:

```
show ports stats atm ds3fetotal [<ports>]
```

where:

- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 34 shows sample output for this command.

Figure 34 show ports stats atm ds3fetotal command output

```
Passport-8610:5# show ports stats atm ds3fetotal

================================================================================
                                        ATM Far End Ds3 Total Stats
================================================================================
PORT    ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION   UNAVAILABLE
NUM     COUNT (CES)      COUNT (CSES)      COUNT (CCV-L)    SECONDS (UAS)
--------------------------------------------------------------------------------
3/5       0                  0                  64800        64800
3/6       0                  0               64800           64800
```

Table 27 describes the DS3 far end total parameters.

Table 27 show ports stats atm ds3fetotal parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (CES)	C-Bit Errored Second (CES) is a single second with one or more C-Bit coding violations (CCV), or one or more Out of Frame, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
SEVERELY ERRORED COUNT (CSES)	C-Bit Severely Errored Second (CSES) is a single second with 44 or more CCVs, or one or more Out of Frame defects, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
CODE VIOLATION COUNT (CCV-L)	C-Bit Coding Violation (CCV) is an error event for C-bit Parity and SYNTRAN DS3 applications.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.

Showing ATM DS3 near end current statistics

To display DS3 near end current statistics, use the following command:

```
show ports stats atm ds3necurrent [<ports>]
```

where:

- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 35 shows sample output for this command.

Figure 35 show ports stats atm ds3necurrent command output

```
Passport-8610:5# show ports stats atm ds3necurrent

================================================================================
                                    ATM Ds3 Near End Current Statistics I
================================================================================
PORT  ERRORED SECONDS  SEVERELY ERRORED  SEVERELY ERRORED  UNAVAILABLE
NUM   COUNT(PES)       SECONDS (PSES)    SECONDS(SEFS)     SECONDS(UAS)
--------------------------------------------------------------------------------
3/5             0                 0                 0          481
3/6             0                 0                 0          481


================================================================================
                                   ATM Ds3 Near End Current Statistics II
================================================================================
PORT  ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION    CODE VIOLATION
NUM   COUNT (CES)      COUNT(CSES)       COUNT (LCV)       COUNT (PCV)
--------------------------------------------------------------------------------
3/5             0                 0                 0            0
3/6             0                 0            987012            0


================================================================================
                                    ATM Ds3 Near End Current Statistics
III

================================================================================
PORT  LINE ERRORED      CODE VIOLATION
NUM   SECONDS(LES)      COUNT(CCV)
--------------------------------------------------------------------------------
3/5           490                 0
3/6           490                 0
```

Table 28 describes the DS3 near end current parameters.

Table 28 show ports stats atm ds3necurrent parameters

Field	Description
PORT NUM	Port number.
P-BIT ERRORED SECONDS COUNT (PES)	P-Bit Errored Second (PES) is a second with one or more PCVs, or one or more Out of Frame defects, or a detected incoming AIS.
P-BIT SEVERELY ERRORED SECONDS (PSES)	P-Bit Severely Errored Second (PSES) is a single second with 44 or more PCVs, or one or more Out of Frame defects, or a detected incoming AIS.
SEVERELY ERRORED SECONDS (SEFS)	The number of Severely Errored Framing Seconds encountered by a DS3 interface in the last 24 hour interval.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable. The interface is said to be unavailable after 10 contiguous PSES. The other error counters are not incremented while the interface is deemed unavailable.
C-BIT ERRORED SECONDS COUNT (CES)	C-Bit Errored Second (CES) is a single second with one or more C-Bit coding violations (CCV), or one or more Out of Frame, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
C-BIT SEVERELY ERRORED SECONDS (CSES)	C-Bit Severely Errored Second (CSES) is a single second with 44 or more CCVs, or one or more Out of Frame defects, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
LINE CODE VIOLATION COUNT (LCV)	Line Coding Violation Count (LCV) is a count of both BiPolar Violations (BPV) and Excessive Zeroes (EXZ) errors.
P-BIT CODE VIOLATION COUNT (PCV)	P-Bit Coding Violation error event is a p-Bit Parity error event for all DS3 applications. A p-Bit Parity Error event is the occurrence of a received P-bit code on the DS3 M-frame that is not identical to the locally calculated code.
LINE ERRORED SECONDS (LES)	A Line Errored Second is a second in which one or more Coding violations occur, or one or more Loss of Signal (LOS) defects.
C-BIT CODE VIOLATION COUNT (CCV)	C-Bit Coding Violation (CCV) is an error event for C-bit Parity and SYNTRAN DS3 applications.

Showing ATM DS3 near end interval statistics

To display DS3 near end interval statistics, use the following command:

```
show ports stats atm ds3neinterval <intervalid> [<ports>]
```

where:

- *intervalid* is the interval identifier
- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 36 shows sample output for this command.

Figure 36 show ports stats atm ds3neinterval command output

```
Passport-8610:5# show ports stats atm ds3neinterval 15

================================================================================
                                    ATM Ds3 Near End Interval Statistics I
================================================================================
PORT  ERRORED SECONDS  SEVERELY ERRORED  SEVERELY ERRORED  UNAVAILABLE
NUM   COUNT(PES)       SECONDS (PSES)    SECONDS(SEFS)     SECONDS(UAS)
--------------------------------------------------------------------------------
3/5             0                 0                 0          900
3/6             0                 0                 0          900


================================================================================
                                    ATM Ds3 Near End Interval Statistics
II
================================================================================
PORT  ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION    CODE VIOLATION
NUM   COUNT (CES)      COUNT(CSES)       COUNT (LCV)       COUNT (PCV)
--------------------------------------------------------------------------------
3/5             0                 0                 0            0
3/6             0                 0           1846800            0


================================================================================
                                    ATM Ds3 Near End Interval Statistics
III

================================================================================
PORT  LINE ERRORED      CODE VIOLATION
NUM   SECONDS(LES)      COUNT(CCV)
--------------------------------------------------------------------------------
3/5           900                 0
3/6           900                 0
```

Table 29 describes the DS3 near end interval parameters.

Table 29 show ports stats atm ds3neinterval parameters

Field	Description
PORT NUM	Port number.
P-BIT ERRORED SECONDS COUNT (PES)	P-Bit Errored Second (PES) is a second with one or more PCVs, or one or more Out of Frame defects, or a detected incoming AIS.

Table 29 show ports stats atm ds3neinterval parameters

Field	Description
P-BIT SEVERELY ERRORED SECONDS (PSES)	P-Bit Severely Errored Second (PSES) is a single second with 44 or more PCVs, or one or more Out of Frame defects, or a detected incoming AIS.
SEVERELY ERRORED SECONDS (SEFS)	The number of Severely Errored Framing Seconds encountered by a DS3 interface in the last 24 hour interval.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable. The interface is said to be unavailable after 10 contiguous PSES. The other error counters are not incremented while the interface is deemed unavailable.
C-BIT ERRORED SECONDS COUNT (CES)	C-Bit Errored Second (CES) is a single second with one or more C-Bit coding violations (CCV), or one or more Out of Frame, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
C-BIT SEVERELY ERRORED SECONDS (CSES)	C-Bit Severely Errored Second (CSES) is a single second with 44 or more CCVs, or one or more Out of Frame defects, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
LINE CODE VIOLATION COUNT (LCV)	Line Coding Violation Count (LCV) is a count of both BiPolar Violations (BPV) and Excessive Zeroes (EXZ) errors.
P-BIT CODE VIOLATION COUNT (PCV)	P-Bit Coding Violation error event is a p-Bit Parity error event for all DS3 applications. A p-Bit Parity Error event is the occurrence of a received P-bit code on the DS3 M-frame that is not identical to the locally calculated code.
LINE ERRORED SECONDS (LES)	A Line Errored Second is a second in which one or more Coding violations occur, or one or more Loss of Signal (LOS) defects.
C-BIT CODE VIOLATION COUNT (CCV)	C-Bit Coding Violation (CCV) is an error event for C-bit Parity and SYNTRAN DS3 applications.

Showing ATM DS3 near end total statistics

To display DS3 near end total statistics, use the following command:

```
show ports stats atm ds3netotal [<ports>]
```

where:

- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 37 shows sample output for this command.

Figure 37 show ports stats atm ds3netotal command output

```
Passport-8610:5# show ports stats atm ds3netotal

================================================================================
                                      ATM Ds3 Near End Total Statistics I
================================================================================
PORT  ERRORED SECONDS  SEVERELY ERRORED  SEVERELY ERRORED  UNAVAILABLE
NUM   COUNT(PES)       SECONDS (PSES)    SECONDS(SEFS)     SECONDS(UAS)
--------------------------------------------------------------------------------
3/5             0                 0                 0        69300
3/6             0                 0                 0        69300


================================================================================
                                     ATM Ds3 Near End Total Statistics II
================================================================================
PORT  ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION    CODE VIOLATION
NUM   COUNT (CES)      COUNT(CSES)       COUNT (LCV)       COUNT (PCV)
--------------------------------------------------------------------------------
3/5             0                 0                 0            0
3/6             0                 0         142203600            0


================================================================================
                                    ATM Ds3 Near End Total Statistics III

================================================================================
PORT  LINE ERRORED      CODE VIOLATION
NUM   SECONDS(LES)      COUNT(CCV)
--------------------------------------------------------------------------------
3/5         69300                 0
3/6         69300                 0
```

Table 30 describes the DS3 near end total parameters.

Table 30 show ports stats atm ds3netotal parameters

Field	Description
PORT NUM	Port number.
P-BIT ERRORED SECONDS COUNT (PES)	P-Bit Errored Second (PES) is a second with one or more PCVs, or one or more Out of Frame defects, or a detected incoming AIS.

Table 30 show ports stats atm ds3netotal parameters

Field	Description
P-BIT SEVERELY ERRORED SECONDS (PSES)	P-Bit Severely Errored Second (PSES) is a single second with 44 or more PCVs, or one or more Out of Frame defects, or a detected incoming AIS.
SEVERELY ERRORED SECONDS (SEFS)	The number of Severely Errored Framing Seconds encountered by a DS3 interface in the last 24 hour interval.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable. The interface is said to be unavailable after 10 contiguous PSES. The other error counters are not incremented while the interface is deemed unavailable.
C-BIT ERRORED SECONDS COUNT (CES)	C-Bit Errored Second (CES) is a single second with one or more C-Bit coding violations (CCV), or one or more Out of Frame, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
C-BIT SEVERELY ERRORED SECONDS (CSES)	C-Bit Severely Errored Second (CSES) is a single second with 44 or more CCVs, or one or more Out of Frame defects, or a detected incoming AIS. This count is only for the SYNTRAN and C-Bit Parity DS3 applications.
LINE CODE VIOLATION COUNT (LCV)	Line Coding Violation Count (LCV) is a count of both BiPolar Violations (BPV) and Excessive Zeroes (EXZ) errors.
P-BIT CODE VIOLATION COUNT (PCV)	P-Bit Coding Violation error event is a p-Bit Parity error event for all DS3 applications. A p-Bit Parity Error event is the occurrence of a received P-bit code on the DS3 M-frame that is not identical to the locally calculated code.
LINE ERRORED SECONDS (LES)	A Line Errored Second is a second in which one or more Coding violations occur, or one or more Loss of Signal (LOS) defects.
C-BIT CODE VIOLATION COUNT (CCV)	C-Bit Coding Violation (CCV) is an error event for C-bit Parity and SYNTRAN DS3 applications.

Showing ATM far end line current statistics

To display far end line current statistics (which is at the receiving end), use the following command:

```
show ports stats atm felinecurrent [<ports>]
```

where:

- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 32 shows sample output for this command.

Figure 38 show ports stats atm felinecurrent command output

```
Passport-8610:5/show/ports/stats/atm# felinecurrent
=========================================================================
                     ATM Far End Line Current Stats
=========================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION UNAVAILABLE
NUM      COUNT (ES)        COUNT (SES)        COUNT (CV-L) SECONDS(UAS)
-------------------------------------------------------------------------
3/1       0                0                  0                0
3/5       0                0                  0                0
9/1       0                0                  0                0
9/2       0                0                  0                0
9/3       0                0                  0                0
9/4       0                0                  0                0
9/5       0                0                  0                0
9/6       0                0                  0                0
9/7       0                0                  0                0
9/8       0                0                  0                0

Passport-8610:5/show/ports/stats/atm# felinecurrent
```

Table 31 describes the ATM far end line parameters.

Table 31 show ports stats atm felinecurrent parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.

Table 31 show ports stats atm felinecurrent parameters

Field	Description
CODE VIOLATION COUNT (CV-L)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS	Number of seconds that the interface is unavailable.

Showing ATM far end line statistics at a specified interval

This command displays statistics (Figure 39) on the far end line over a 15-minute interval. You specify which interval, or span of intervals, to display for the command.

To display ATM far end line interval statistics, use the following command:

```
show ports stats atm felineinterval <intervalid> [<ports>]
```

where:

- *intervalid* is the interval identifier
- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 39 shows sample output for this command.

Figure 39 show ports stats atm felineinterval command output

```
Passport-8610:5/show/ports/stats/atm# felineinterval 96
================================================================================
                    ATM Far End Line Interval Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION UNAVAILABLE
NUM       COUNT (ES)        COUNT (SES)        COUNT (CV-L) SECONDS(UAS)
--------------------------------------------------------------------------------
3/1       0                 0                 0                 0
3/5       0                 0                 0                 0
9/1       0                 0                 0                 0
9/2       0                 0                 0                 0
9/3       0                 0                 0                 0
9/4       0                 0                 0                 0
9/5       0                 0                 0                 0
9/6       0                 0                 0                 0
9/7       0                 0                 0                 0
9/8       0                 0                 0                 0
INTERVAL ID = 96
Passport-8610:5/show/ports/stats/atm#
```

Table 32 describes the ATM far end line interval parameters.

Table 32 show ports stats atm felineinterval parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-L)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	The number of seconds that the interface is unavailable.
INTERVAL ID	Specified interval.

Showing ATM far end path current statistics

To display far end path current statistics (which is at the receiving end), use the following command:

```
show ports stats atm fepathcurrent [<ports>]
```

where:

- *ports* is an optional parameter that allows you to specify stats for a specific port.

Figure 40 shows sample output for this command.

Figure 40 show ports stats atm fepathcurrent command output

```
Passport-8610:5/show/ports/stats/atm# fepathcurrent
================================================================================
                      ATM Far End Path Current Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION    UNAVAILABLE
NUM      COUNT (ES)        COUNT (SES)        COUNT (CV-P)      SECONDS(UAS)
--------------------------------------------------------------------------------
3/1       0                 0                 0                 264
3/5       0                 0                 0                 264
9/1       0                 0                 0                 0
9/2       0                 0                 0                 0
9/3       0                 0                 0                 0
9/4       0                 0                 0                 0
9/5       0                 0                 0                 0
9/6       0                 0                 0                 0
9/7       0                 0                 0                 0
9/8       0                 0                 0                 0

Passport-8610:5/show/ports/stats/atm# fepathcurrent
```

Table 33 describes the far end path parameters.

Table 33 show ports stats atm fepathcurrent parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	The number of seconds that the interface is unavailable.

Showing ATM far end path statistics at a specified interval

To display statistics on the far end path over a 15-minute interval, use the following command:

```
show ports stats atm fepathinterval <intervalid> [<ports>]
```

Figure 41 shows sample output for this command.

Figure 41 show ports stats atm fepathinterval command output

```
Passport-8610:5/show/ports/stats/atm# fepathinterval 96

================================================================================
                    ATM Far End Path Interval Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION    UNAVAILABLE
NUM      COUNT (ES)        COUNT (SES)        COUNT (CV-P)      SECONDS(UAS)
--------------------------------------------------------------------------------
3/1       0                 0                 0                 900
3/5       0                 0                 0                 900
9/1       0                 0                 0                 0
9/2       0                 0                 0                 0
9/3       0                 0                 0                 0
9/4       0                 0                 0                 0
9/5       0                 0                 0                 0
9/6       0                 0                 0                 0
9/7       0                 0                 0                 0
9/8       0                 0                 0                 0

INTERVAL ID = 96
Passport-8610:5/show/ports/stats/atm# fepathinterval 96
```

Table 34 describes the ATM far end path interval parameters.

Table 34 show ports stats atm fepathinterval parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
INTERVAL ID	Specified interval.

Showing ATM line statistics

To display current statistics for the line, use the following command:

```
show ports stats atm linecurrent [<ports>]
```

Figure 42 shows sample output for this command.

Figure 42 show ports stats atm linecurrent command output

```
Passport-8610:5/show/ports/stats/atm# linecurrent

================================================================================
                            ATM Line Current Stats
================================================================================
PORT  ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION  UNAVAILABLE
NUM   COUNT (ES)       COUNT (SES)       COUNT (CV-L)    SECONDS (UAS) STATUS
--------------------------------------------------------------------------------
3/1       0              0                 0             110       LineAIS
3/5       0              0                 0             110       Line AIS
9/1       0              0                 0             0         No Defect
9/2       0              0                 0             0         No Defect
9/3       0              0                 0             0         No Defect
9/4       0              0                 0             0         No Defect
9/5       0              0                 0             0         No Defect
9/6       0              0                 0             0         No Defect
9/7       0              0                 0             0         No Defect
9/8       0              0                 0             0         No Defect

Passport-8610:5/show/ports/stats/atm# linecurrent
```

Table 35 describes the ATM line parameters.

Table 35 show ports stats atm linecurrent parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).

Table 35 show ports stats atm linecurrent parameters

Field	Description
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-L)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
STATUS	Status of defects.

Showing ATM line statistics at a specified interval

To display statistics for the line over a 15-minute interval, use the following command:

```
show ports stats atm lineinterval <intervalid> [<ports>]
```

You can specify any interval or span of intervals.

Figure 43 shows sample output for this command.

Figure 43 show ports stats atm lineinterval command output

```
Passport-8610:5/show/ports# stats atm lineinterval 96
================================================================================
                          ATM Line Interval Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION    UNAVAILABLE
NUM      COUNT (ES)      COUNT (SES)      COUNT (CV-L)    SECONDS (UAS)
--------------------------------------------------------------------------------
3/1       0                 0                 0                 990
3/5       0                 0                 0                 990
9/1       0                 0                 0                 0
9/2       0                 0                 0                 0
9/3       0                 0                 0                 0
9/4       0                 0                 0                 0
9/5       0                 0                 0                 0
9/6       0                 0                 0                 0
9/7       0                 0                 0                 0
9/8       0                 0                 0                 0

INTERVAL ID = 96
Passport-8610:5/show/ports#
```

Table 36 describes the ATM line interval parameters.

Table 36 show ports stats atm lineinterval parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-L)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.

Showing ATM path statistics

To display information about current statistics on the path (on the transmitting end), use the following command:

```
show ports stats atm pathcurrent [<ports>]
```

Figure 44 shows sample output for this command.

Figure 44 show ports stats atm pathcurrent command output

```
Passport-8610:5/show/ports/stats/atm# pathcurrent

================================================================================
                            ATM Path Current Stats
================================================================================
PORT  ERRED SECS  SEVERELY ERRED CODE VIOLATION  UNAVAILABLE
NUM   COUNT (ES)  COUNT (SES)    COUNT (CV-P)    SECONDS (UAS)  STATUS WIDTH
--------------------------------------------------------------------------------
3/1       0         0                0         160       Path AIS  3
3/5       0         0                0         160       Path AIS  3
9/1       0         0                0         0         No Defect 2
9/2       0         0                0         0         No Defect 2
9/3       0         0                0         0         No Defect 2
9/4       0         0                0         0         No Defect 2
9/5       0         0                0         0         No Defect 2
9/6       0         0                0         0         No Defect2
9/7       0         0                0         0         No Defect2
9/8       0         0                0         0         No Defect 2
Passport-8610:5/show/ports/stats/atm#
```

Table 37 describes the ATM path parameters.

Table 37 show ports stats atm pathcurrent parameters

Field	Description
PORT NUM	Port number.
ERRED SECS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).

Table 37 show ports stats atm pathcurrent parameters

Field	Description
SEVERELY ERRED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
STATUS / WIDTH	Status and number of defects.

Showing statistics for ATM path at an interval

To display statistics on the path for a 15-minute interval, use the following command:

```
show ports stats atm pathinterval <intervalid> [<ports>]
```

Figure 45 shows sample output for this command.

Figure 45 show ports stats atm pathinterval command output

```
Passport-8610:5/show/ports/stats/atm# pathinterval 96

================================================================================
                          ATM Path Interval Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION    UNAVAILABLE
NUM      COUNT (ES)        COUNT (SES)        COUNT (CV-P)      SECONDS(UAS)
--------------------------------------------------------------------------------
3/1       0                0                  0                 160
3/5       0                0                  0                 160
9/1       0                0                  0                 0
9/2       0                0                  0                 0
9/3       0                0                  0                 0
9/4       0                0                  0                 0
9/5       0                0                  0                 0
9/6       0                0                  0                 0
9/7       0                0                  0                 0
9/8       0                0                  0                 0

INTERVAL ID = 96
Passport-8610:5/show/ports/stats/atm#
```

Table 38 describes the ATM path interval parameters.

Table 38 show ports stats atm pathinterval parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
INTERVAL ID	Specified interval.

Showing ATM section statistics

To display the current statistics on the section, use the following command:

`show ports stats atm sectioncurrent [<ports>]`

Figure 46 shows sample output for this command.

Figure 46 show ports stats atm sectioncurrent command output

```
Passport-8610:5/show/ports/stats/atm# sectioncurrent

================================================================================
                        ATM Section Current Stats
================================================================================
PORT  ERRORED SECONDS SEVERELY ERRORED CODE VIOLATION  SEVERELY ERRORED
NUM   COUNT (ES)      COUNT (SES)      COUNT (CV-S)    FRAMES (SEF) STATUS
--------------------------------------------------------------------------------
3/1    796            796              0              796          LOS
3/5    796            796              0              796          LOS
9/1    0              0                0              0            No Defect
9/2    0              0                0              0            No Defect
9/3    0              0                0              0            No Defect
9/4    0              0                0              0            No Defect
9/5    0              0                0              0            No Defect
9/6    0              0                0              0            No Defect
9/7    0              0                0              0            No Defect
Passport-8610:5/show/ports/stats/atm# sectioncurrent
```

Table 39 describes the ATM section parameters.

Table 39 show ports stats atm sectioncurrent parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.

Table 39 show ports stats atm sectioncurrent parameters

Field	Description
CODE VIOLATION COUNT (CV-S)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
SEVERELY ERRORED FRAMES (SEF)	Number of seconds that the interface is unavailable.
STATUS	Indicates status of defects.

Showing ATM section statistics at an interval

To display statistics on the section over a 15-minute interval, use the following command:

```
show ports stats atm sectioninterval <intervalid> [<ports>]
```

Figure 47 shows sample output for this command.

Figure 47 show ports stats atm sectioninterval command output

```
Passport-8610:5/show/ports/stats/atm# sectioninterval 96
================================================================================
                         ATM Section Interval Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION SEVERELY ERRORED
NUM       COUNT (ES)        COUNT (SES)        COUNT (CV-S) FRAMES (SEF)
--------------------------------------------------------------------------------
3/1       900               900                0                 900
3/5       900               900                0                 900
9/1       0                 0                  0                 0
9/2       0                 0                  0                 0
9/3       0                 0                  0                 0
9/4       0                 0                  0                 0
9/5       0                 0                  0                 0
9/6       0                 0                  0                 0
9/7       0                 0                  0                 0
9/8       0                 0                  0                 0
INTERVAL ID = 96
Passport-8610:5/show/ports/stats/atm# sectioninterval 96
```

Table 40 describes the ATM section interval statistics parameters.

Table 40 show ports stats atm sectioninterval parameters

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-S)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
SEVERELY ERRORED FRAMES (SEF)	Severely Errored Framing Second (SEFs) is a second containing one or more SEF events.
INTERVAL ID	Specified interval.

Showing ATM SONET medium statistics

To display statistics on the SONET medium, use the following command:

```
show ports stats atm sonetmediumtbl [<ports>]
```

Figure 48 shows sample output for this command.

Figure 48 show ports stats atm sonetmediumtbl command output

```
Passport-8610:5/show/ports/stats/atm# sonetmediumtbl
  ================================================================================
                              ATM SONET Medium Table
================================================================================
PORT      MEDIUM     TIME       VALID          LINE   LINE       CIRCUIT
NUM       TYPE       ELAPSED    INTERVALS      CODING TYPE       ID
--------------------------------------------------------------------------------
3/1            0          731        96          4          3          53754784
3/5            0          731        96          4          3          53754784
9/1            0          715        96          4          4          53754784
9/2            0          715        96          4          4          53754784
9/3            0          715        96          4          4          53754784
9/4            0          715        96          4          4          53754784
9/5            0          715        96          4          4          53754784
9/6            0          715        96          4          4          53754784
9/7            0          715        96          4          4          53754784
9/8            0          715        96          4          4          53754784

Passport-8610:5/show/ports/stats/atm# sonetmediumtbl
```

Table 41 describes the ATM SONET parameters.

Table 41 show ports stats atm sonetmediumtbl parameters

Field	Description
PORT NUM	Port number.
MEDIUM TYPE	Identifies whether a sonet or sdh signal is used across the interface.
TIME ELAPSED	Number of seconds, including partial seconds, that have elapsed since the beginning of the current measurement period. If the current interval exceeds the maximum value, the agent will return the maximum value.
VALID INTERVALS	Number of previous 15-minute intervals for which data was collected.
LINE CODING	Line coding for this interface. The B3ZS and CMI are used for electrical SONET/SDH signals (STS-1 and STS-3). The Non-Return to Zero (NZR) and the Return to Zero are used for optical SONET/SDH signals.

Table 41 show ports stats atm sonetmediumtbl parameters

Field	Description
LINE TYPE	Line type for this interface. The line types are Single Mode fiber or Multi-Mode fiber interfaces.
CIRCUIT ID	Transmission vendor's circuit identifier, to facilitate troubleshooting.

Configuring ATM F5-OAM End-to-End Loopback

A 8672 ATM modules, by default, replies to ATM F5-OAM Loopback requests received. However, the transmission of F5-OAM Loopback requests and the processing of F5-OAM Loopback replies received require enabling this feature on a PVC by PVC basis. It is recommended that you enable ATM F5-OAM on all the PVCs configured on the PP8672 ATM port in order for upper layer protocols such as MLT and OSPF to be immediately aware of the port down status or link failures.

The F5-OAM loopback feature uses the following CLI commands:

- config atm <slot/port> pvc f5-oam
- show ports info atm pvc [slot/port]
- show ports info atm f5-oam [slot/port]
- clear atm f5-oam [slot/port]

Configuring ATM PVC F5-OAM loopback

To enable/disable and configure the F5-OAM Loopback feature for a virtual circuit (VC), use the following command:

```
config atm <slot/port> pvc f5-oam <vpi.vci> <enable|disable>
[send <value>] [retry <value>] [up <value>] [down <value>]
[trap <enable|disable>]
```

When you use this command to disable the F5-OAM Loopback on a VC, the configuration parameters are ignored.

When you use this command to enable the F5-OAM Loopback on a VC, the other parameters configure the F5-OAM Loopback. When the F5-OAM Loopback on a VC is already enabled, an enable command towards this VC may change its F5-OAM Loopback configuration but it does not alter its F5-OAM statistics. When the F5-OAM Loopback on a VC is disabled, an enable command towards this VC enables and configures its F5-OAM Loopback, and clears its F5-OAM Loopback statistics.

Table 42 describes the F5-OAM Loopback parameters.

Table 42 F5-OAM Loopback parameters

Configuration	Default	Values	Description
<enable|disable>	disabled	Enable/Disable	Enables/disables the F5-OAM Loopback feature.
send <value>	5 seconds	1..255	Sets the transmission rate (in seconds) of F5-OAM Loopback requests. This field is also referred as “send-frequency”.
retry <value>	1 second	1..255	Sets the retry-transmission rate (in seconds) of F5-OAM Loopback requests. This field is also referred as “retry-frequency”.
up <value>	3 responses	1..255	Set the number of consecutive F5-OAM Loopback replies that must be received to change the Loopback State to “up.” This configuration is also referred as “up-count”.
down <value>	5 responses	1..255	Sets the number of consecutive F5-OAM Loopback replies that must fail to change the Loopback State to “down.” This configuration is also referred as “down-count”.
trap <value>	disabled	Enable/Disable	Enables/disables the transmission of an SNMP Trap when the F5-OAM Loopback changes from the DOWN VERIFY to DOWN state or from the UP VERIFY to UP state.

For example, to *enable* F5-OAM Loopback for VPI=0 & VCI=33 in port 6 of an ATM card in slot 3, and configure it with trap enabled, a retry-frequency of 2 seconds and up-count of 5 times, you would enter the following command:

Passport-8610:5# `config atm 3/6 pvc f5 0.33 enable trap enable retry 2 up 5`

To *disable* the F5-OAM Loopback for VPI=0 & VCI=33 in port 6 of an ATM card in slot 3:

Passport-8610:5# `config atm 3/6 pvc f5 0.33 disable`

Showing ATM PVC information

To display the F5-OAM Loopback configuration among other PVC configurations, use the following command:

`show ports info atm pvc [slot/port]`

Figure 49 displays sample output for this command.

Figure 49 show ports info atm pvc [slot/port] command output

```
Passport-8610:5# show ports info atm pvc

================================================================================
                                       ATM PVC
================================================================================
PORT    PVC            SERVICE   F5     OAM    SEND   RETRY    UP     DOWN
NUM   VPI.VCI   ENCAPS   TYPE    OAM    TRAP   FREQ    FREQ   COUNT  COUNT
--------------------------------------------------------------------------------
3/5   2.50      llc-snap  VBR  enable   disable  5      1      3      5
```

show ports info atm f5-oam [slot/port]

The `show ports info atm f5-oam [slot/port]` command displays the F5-OAM Loopback status and statistics for a particular PVC.

Figure 50 shows sample output for this command.

Figure 50 show ports info atm f5-oam [slot/port] command output

```
Passport-8610:5# show ports info atm f5-oam 3/5

================================================================================
                                        ATM PVC F5 Status & Statistics
================================================================================
PORT    PVC         F5 VC     LOOPBACK    LOOPBACK    LOOPBACK
NUM   VPI.VCI       STATUS    REQ SENT    REPLY RCV   REPLY SENT
--------------------------------------------------------------------------------
3/5   2.50          down        0           0           0
```

Table 43 defines the status and statistics in the `show ports info atm f5-oam [slot/port]` command.

Table 43 Status and statistic definition

F5 VC Status	Definition
NOT MANAGED	The VC is not being managed by OAM. (The VC is not transmitting F5-OAM Loopback Requests as F5-OAM Loopback is disabled.)
DOWN VERIFY	An OAM loopback failed. End-to-end F5-OAM loopback cells are sent at the specified retry frequency to verify that the VC is down. After down-count unsuccessful retries, the VC goes to the down state (see LbDownCount in Table 15 on page 71).
DOWN	The VC has not received responses to end-to-end F5-OAM loopback cells.
UP VERIFY	An OAM loopback was successful. End-to-end F5-OAM loopback cells are sent at the specified retry frequency to verify the VC is really up. After up-count successive and successful loopback retries, the VC goes to the Up state (see LbUpCount in Table 15 on page 71).
UP	End-to-end loopbacks are successful.
Loopback Req Sent	Number of F5-OAM Loopback requests transmitted for a particular PVC.
Loopback Reply Rcv	Number of F5-OAM Loopback replies received for a particular PVC.
Loopback Reply Sent	Number of F5-OAM Loopback replies transmitted in response to a F5-OAM Loopback Request Received for a particular PVC. Although this functionality occurs while the F5-OAM Loopback is disabled, this statistic only starts when the F5-OAM Loopback is enabled.

Clearing F5-OAM statistics

To clear the F5-OAM statistics for all the F5-OAM loopbacks that are currently enabled under the ATM port and slot, use the following command:

```
clear atm f5-oam
```

To clear the F5-OAM statistics for a particular ATM port and slot, enter this command:

```
clear atm f5-oam [slot/port]
```

Displaying packet loss counters

The CLI command `show ports stats interface main` displays packet loss counters. For ATM ports, only outloss packets are displayed. All other counters do not apply to ATM ports.

Figure 51 shows sample output for this command.

Figure 51 show ports stats interface main command output

```
Passport-8610co:5# show ports stats interface main

================================================================================
                                      Port Stats Interface
================================================================================
PORT     IN          OUT         IN         OUT          IN         OUT     OUTLOSS
NUM    OCTETS      OCTETS     PACKET     PACKET     FLOWCTRL  FLOWCTRL  PACKETS
--------------------------------------------------------------------------------
1/1    7902        17236      103        244        0         0         0
1/2    0           0          0          0          0         0         0
1/3    0           0          0          0          0         0         0
1/4    0           0          0          0          0         0         0
1/5    0           0          0          0          0         0         0
1/6    0           0          0          0          0         0         0
1/7    0           0          0          0          0         0         0
1/8    0           0          0          0          0         0         0
1/9    0           0          0          0          0         0         0
1/10   0           0          0          0          0         0         0
1/11   0           0          0          0          0         0         0
1/12   0           0          0          0          0         0         0
1/13   0           0          0          0          0         0         0
1/14   0           0          0          0          0         0         0
1/15   0           0          0          0          0         0         0
1/16   0           0          0          0          0         0         0
1/17   0           0          0          0          0         0         0
1/18   0           0          0          0          0         0         0
1/19   0           16860      0          255        0         0         0
1/20   0           0          0          0          0         0         0
1/21   0           0          0          0          0         0         0
1/22   0           0          0          0          0         0         0
1/23   0           0          0          0          0         0         0
1/24   0           0          0          0          0         0         0
```

Chapter 5
Configuration examples

This chapter provides typical configuration examples that you can refer to when configuring your 8672 ATM modules.

This chapter includes the following topics:

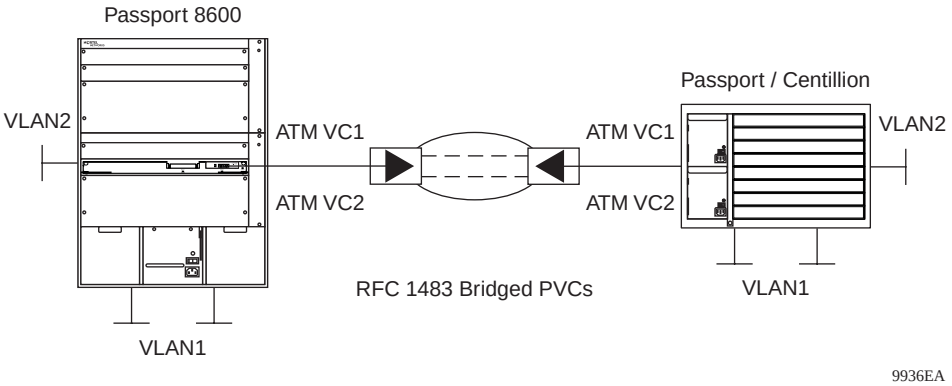
Bridging point-to-point traffic using an ATM 1483 PVC

In this configuration example (Figure 52), the 8672 ATM modules have an ATM 1483 PVC bridged across an ATM PVC network. Use a separate ATM1483 PVC for each VLAN. The VLANs may appear on the same port or on different ports of the 8672 ATM moduless. You cannot bridge between PVCs in the same VLAN on the same port of the 8672 ATM modules.

Nortel Networks recommends that you create a new STP group for bridging between ATM ports and Ethernet ports. You should remove the ATM port from the default STP group and from the default VLAN. This minimizes BPDU traffic to the ATM port. Passport ports receive BPDU traffic for the default STP group and the tagged VLAN.

Figure 52 shows point-to-point bridging using 1483 PVCs.

Figure 52 Point-to-point bridging using 1483 PVCs



To complete this configuration, use the following procedures:

- "Creating a VLAN byPort and adding ports, next
- "Configuring two ATM 1483 PVCs on the same ATM port" on page 141
- "Associating the PVC with the VLAN" on page 139

Use Device Manager to perform these configuration and related tasks on the 8672 ATM modules.

Creating a VLAN byPort and adding ports

1 From the Device Manager menu bar, choose VLAN > VLANs.

The VLAN dialog box opens with the Basic tab displayed (Figure 53).

Figure 53 Basic tab

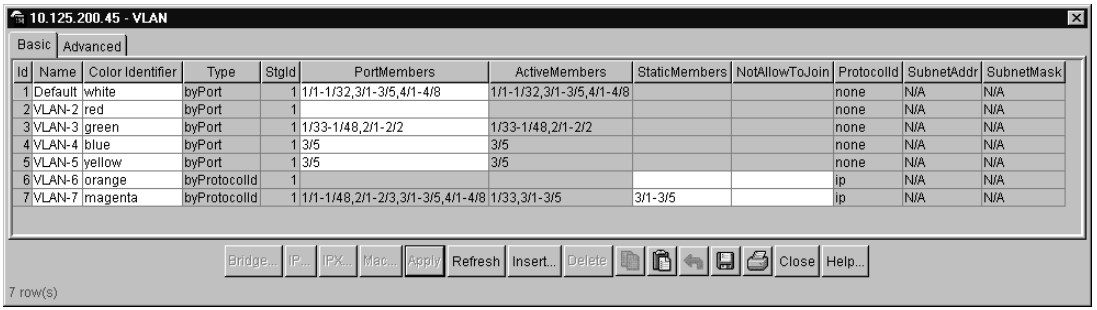


Table 44 describes the Basic tab fields.

Table 44 Basic tab fields

Field	Description
Id	Unique VLAN identifier.
Name	An administratively-assigned name for this VLAN.
ColorIdentifier	An administratively-assigned color code for this VLAN. The value of this object is used by the VLAN Manager GUI tool to select a color when it draws this VLAN on the screen.
Type	Type of VLAN, distinguished according to the policy used to define its port membership.
StgId	Spanning Tree Group (STG) used by the VLAN to determine the state of its ports. If the VLAN is not associated with any STG, this value should be set to zero.
PortMembers	Set of ports that are members (static or dynamic) of this VLAN.
ActiveMembers	Set of ports that are currently active in this VLAN. Active ports include all static ports and any dynamic ports where the VLAN policy was met.
StaticMembers	Set of ports that are static members of this VLAN. A static member of a VLAN is always active and is never aged out.
NotAllowtoJoin	Set of ports that are not allowed to become members of this VLAN.
ProtocolId	Protocol identifier of this VLAN. This value is meaningful only if rcVlanType is equal to byProtocolId(3).

Table 44 Basic tab fields (continued)

Field	Description
SubnetAddr	IP subnet address of this VLAN. This value is meaningful only if rcVlanType is equal to byIpSubnet(2). For other VLAN types it should have the value 0.0.0.0.
SubnetMask	IP subnet mask of this VLAN. This value is meaningful only if rcVlanType is equal to byIpSubnet(2). For other VLAN types it should have the value 0.0.0.0.

2 Click Insert.

The VLAN, Insert Basic dialog box opens (Figure 54).

Figure 54 VLAN, Insert Basic dialog box

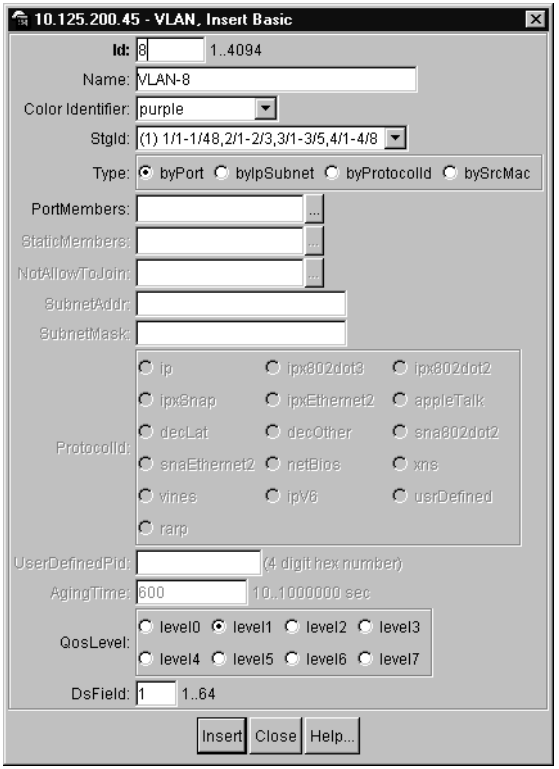


Table 45 describes the VLAN, Insert Basic dialog box fields.

Table 45 VLAN, Insert Basic dialog box fields

Field	Description
Id	Unique VLAN identifier.
Name	An administratively-assigned name for this VLAN.
ColorIdentifier	An administratively-assigned color code for this VLAN. The value of this object is used by the VLAN Manager GUI tool to select a color when it draws this VLAN on the screen.
StgId	Spanning Tree Group (STG) used by the VLAN to determine the state of its ports. If the VLAN is not associated with any STG, this value should be set to zero.
Type	Type of VLAN, distinguished according to the policy used to define its port membership.
PortMembers	Set of ports that are members (static or dynamic) of this VLAN.
QoSLevel	Quality of Service level.

3 Do the following:

a In the Id field, enter the Id number for the VLAN (an integer between 0 and 4094).

b In the Name field, enter the VLAN name.

c In the Color Identifier field, select a color from the list.

d In the StgIdField, select the STG for the port.

e In the Type field, chick byPort.

f In the PortMembers field, click the button to view ports.

The VlanPortMembers dialog box opens (Figure 55).

Figure 55 VlanPortMembers dialog box

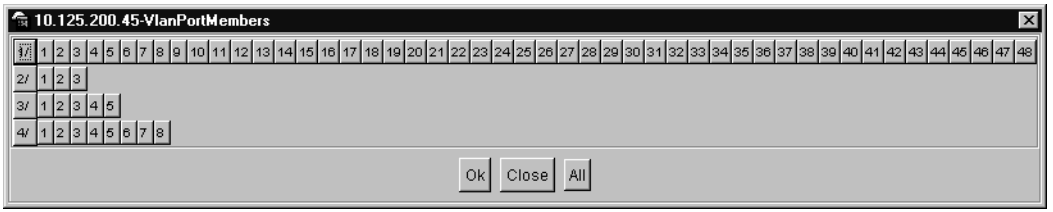


Table 46 describes the VlanPortMembers dialog box fields.

Table 46 VlanPortMembers dialog box fields

Field	Description
Left column	Card number.
All other numbers	Port numbers.

4 Click port numbers to add ports to the VLAN.

5 Click OK.

The VlanPortMembers dialog box closes and the VLAN, Insert Basic dialog is redisplayed.

6 Click Close.

Configuring an ATM 1483 PVC

To configure an ATM 1483 PVC:

1 From the Device Manager menu bar, choose Edit > ATM.

The port dialog box opens with the ATM tab displayed (Figure 20).

Table 6 on page 49 describes the ATM tab fields.

2 Click the ATM PVC tab.

The ATM PVC tab opens (Figure 7 on page 51).

Table 7 on page 51 describes the ATM PVC tab fields.

3 Click Insert.

The ATM, Insert ATM dialog box opens (Figure 8 on page 53).

Table 8 on page 53 describes the ATM, Insert ATM tab fields.

4 Do the following:

a In the Port field, click the button to view ports.

b Select the port.

c In the Vpi field, type the VPI value based on the VPI bit set in the ATM port tag (i.e., if Vpi bit is 4, the VPI range is 0..15).

d In the Vci field, type the VCI value based on the VPI bit set in the ATM port configuration (see Table 8 on page 53 for Device Manager information or Table 22 on page 93 for CLI information).

e In the Name field, type the name of the ATM PVC card.

f In the Encapsulation field, select the encapsulation method (null or IIcSnap).

g In the Service type field, select the service type (ubr or vbr).

h If you select vbr in the Service type field, complete these fields:

In the PeakCellRate field, enter the PCR (an integer between 86 and 733490).

In the SustainedCellRate field, enter the SCR (an integer between 86 and 733490).

In the MaxBurstSize field, type the maximum burst size (an integer between 2 and 255).

5 Click Insert.

The ATM, Insert ATM dialog box closes, and the ATM PVC tab is redisplayed.

6 Click Close.

Associating the PVC with the VLAN

1 From the Device Manager menu bar, choose Edit > ATM.

The Port dialog box opens with the ATM tab displayed (Figure 6 on page 49).

Table 6 on page 49 describes the ATM tab items.

2 Click the ATM 1483 ELAN tab.

The ATM 1483 ELAN tab opens.

3 Click Insert.

The Insert ATM 1483 ELAN dialog box opens (Figure 13 on page 61).

Table 12 on page 61 describes the Insert ATM 1483 ELAN dialog box fields.

4 Do the following:

   a In the Port field, click the button to view ports.

   b Select the port for which you configured the ATM PVC in "Configuring two ATM 1483 PVCs on the same ATM port" on page 141.

   c In the VlanId field, enter the VLAN Id you created in "Creating a VLAN byPort and adding ports" on page 134.

   d In the PvcIds field, enter the value for the PVC IDs you created in "Configuring two ATM 1483 PVCs on the same ATM port" on page 141.

   e In the ConnectType field, select bridged.

5 Click Insert.

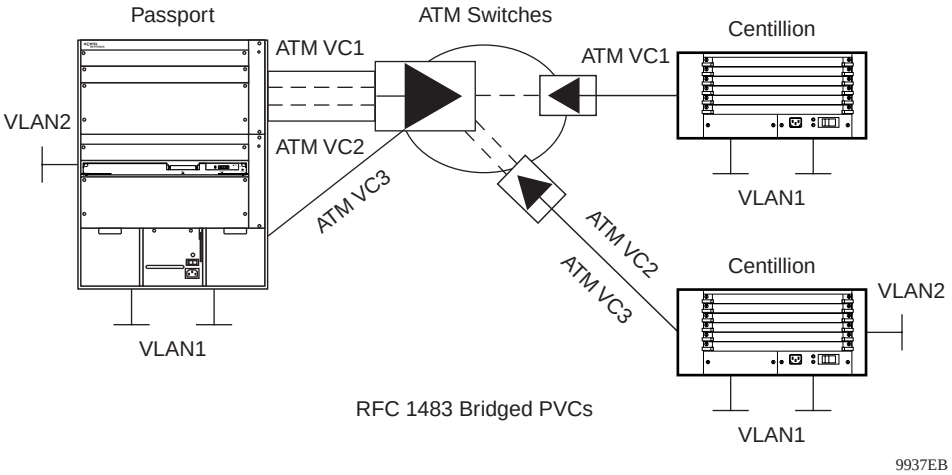
   The Insert ATM 1483 ELAN dialog box closes, and the ATM 1483 ELAN tab is redisplayed.

6 Click Close.

Bridging point-to-multipoint traffic using an ATM 1483 PVC

In the configuration shown in Figure 56, the 8672 ATM modules is configured as a bridging hub to spokes through the WAN. Bridging is not allowed between PVCs in the same ELAN. For point-to-multipoint bridging, the end stations connected by each PVC circuit cannot communicate with one another.

Figure 56 Point-to-multipoint bridging using ATM 1483 PVCs



This configuration requires the following procedures:

- "Configuring two ATM 1483 PVCs on the same ATM port," next
- "Associating the PVCs with the same VLAN" on page 141

Use Device Manager or the CLI to perform these configuration and related tasks on the 8672 ATM modules.

Configuring two ATM 1483 PVCs on the same ATM port

Follow the procedures outlined in "Bridging point-to-point traffic using an ATM 1483 PVC" on page 133 to configure two ATM PVCs on the same ATM port.

Associating the PVCs with the same VLAN

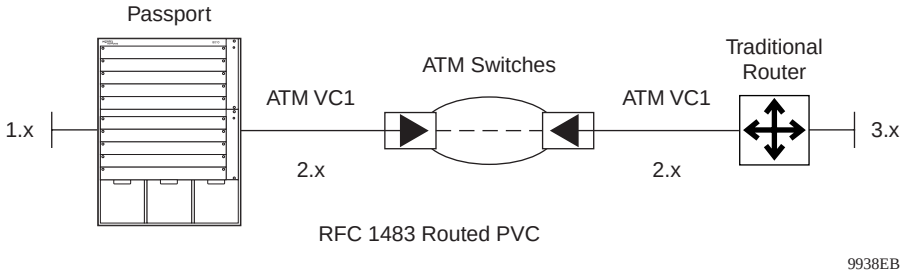
Follow the procedures outlined in "Associating the PVC with the VLAN" on page 139 to associate both PVCs with the same VLAN.

The 8672 ATM modules directs the two ATM 1483 bridged PVCs to two different ATM ports on the other end.

Configuring an IP routing 1483 PVC

In the configuration shown in Figure 57, the 8672 ATM modules has an ATM 1483 PVC as the sole member of a VLAN configured for IP routing.

Figure 57 IP routing with ATM 1483 PVCs



Note: Each configured ATM 1483 PVC uses one VLAN. The 8672 ATM modules can be configured for a maximum of 256 VLANs per MDA and a maximum of 512 VLANs per card.

This configuration requires the following procedures:

- "Creating a VLAN byPort and adding ports" on page 134
- "Assigning IP addresses" on page 143
- "Enabling RIP routing" on page 145
- "Configuring a null-encapsulation PVC" on page 148
- "Associating the PVC with the VLAN" on page 148

Creating two VLANs byPort

To create two VLANs byPort, see "Creating a VLAN byPort and adding ports" on page 134. One VLAN must have only one ATM port. The second VLAN can have one or multiple Ethernet ports.

Assigning IP addresses

To assign an IP address to both VLANs:

1 From the Device Manager menu bar, choose VLAN > VLANs.

The VLAN dialog box opens with the Basic tab displayed (Figure 53 on page 135).

Table 44 on page 135 describes the fields in the VLAN Basic tab.

2 Click one of the VLANs.

3 Click IP.

The IP, VLAN dialog box opens with the IP Address tab displayed (Figure 58).

Figure 58 IP Address tab

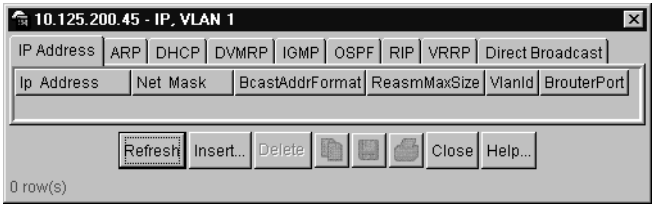


Table 47 describes the IP Address tab fields.

Table 47 IP Address tab fields

Field	Description
Ip Address	IP address of the VLAN
Net Mask	Subnet mask associated with the IP address of the entry.
BcastAddrFormat	IP broadcast address format used on this interface.
ReasmMaxSize	Size of the largest IP datagram which this entity can re-assemble from incoming IP fragmented datagrams received on this interface.

Table 47 IP Address tab fields (continued)

Field	Description
VlanId	Unique VLAN identifier.
BrouterPort	Indicates whether this entry corresponds to a brouter port as opposed to a routable VLAN. This value cannot be changed after the row is created.

4 Click Insert.

The IP, VLAN, Insert IP Address dialog box opens (Figure 59).

Figure 59 IP, VLAN, Insert IP Address dialog box

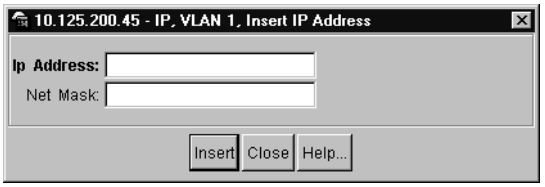


Table 48 describes the IP, VLAN, Insert IP Address dialog box fields.

Table 48 IP, VLAN, Insert IP Address dialog box fields

Field	Description
Ip Address	IP address of the VLAN
Net Mask	Subnet mask associated with the IP address of the entry.

5 In the IP Address field, type the IP address for the VLAN.

6 In the Net Mask field, type the net mask value.

Note: Use different subnets for each IP address.

7 Click Insert.

The IP, VLAN, Insert IP Address dialog box closes and the IP, VLAN dialog box is redisplayed.

8 Click Close.

Enabling RIP routing

Note: The 8672 ATM modules supports only RIP version 2.

1 From the Device Manager menu bar, choose VLAN > VLANs.

The VLAN dialog box opens with the Basic tab displayed (Figure 53).

Table 44 on page 135 describes the VLAN Basic tab fields.

2 Click one of the VLANs.

3 Click IP.

The IP, VLAN dialog box opens with the IP Address tab displayed (Figure 58 on page 143).

Table 47 on page 143 describes the IP Address tab fields.

4 Click the RIP tab.

The RIP tab opens (Figure 60).

Figure 60 RIP tab

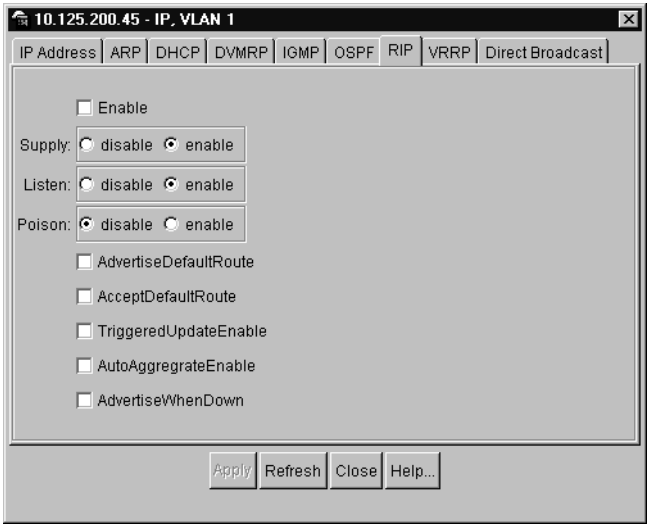


Table 49 describes the RIP tab fields.

Table 49 RIP tab fields

Field	Description
Enable	IP address of the VLAN.
Supply	Enables or disables RIP supply on the specified interface.
Listen	Enables or disables RIP reception on the specified interface.
Poison	Enables or disables operation of poison reverse on the specified interface. If poison is disabled, split-horizon operation is enabled.
AdvertiseDefaultRoute	Indicates whether this interface should advertise a RIP default route.
AcceptDefaultRoute	Indicates whether this interface should accept a RIP default route.
TriggeredUpdateEnable	Indicates whether the RIP triggered update feature should be enabled on this interface.
AutoAggregateEnable	Indicates whether the auto aggregation feature should be enabled on this interface.
AdvertiseWhenDown	Indicates whether vlan state change should be notified to layer 3 or not, provided the vlan is configured as routable interface. Also used for single routable ports, in that case the criteria for state is PortOperStatus.

5 Click Enable.

6 Click Apply.

The IP Address tab is redisplayed.

7 Click Close.

Enabling OSPF routing

If the routing protocol is OSPF, to enable OSPF routing:

1 From the Device Manager menu bar, choose VLAN > VLANs.

The VLAN dialog box opens with the Basic tab displayed (Figure 53 on page 135).

Table 44 on page 135 describes the fields in the VLAN Basic tab.

2 Click one of the VLANs.

3 Click IP.

The IP, VLAN, Insert IP Address dialog box opens with the IP Address tab displayed (Figure 59 on page 144).

Table 47 on page 143 describes the Ip Address tab fields.

4 Click the OSPF tab.

The OSPF tab opens (Figure 61).

Figure 61 OSPF tab

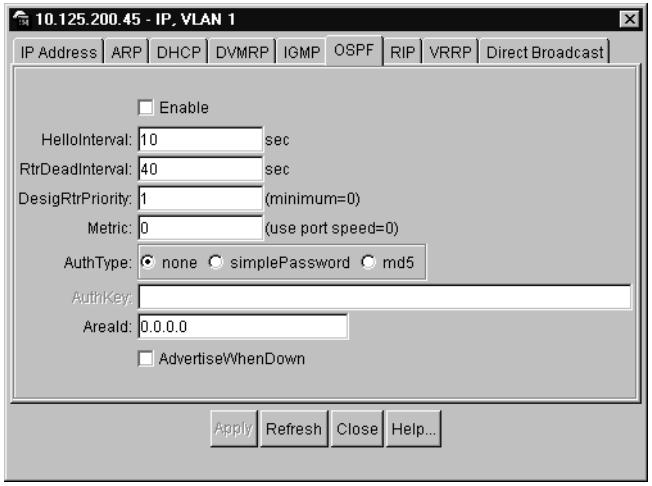


Table 50 describes the OSPF tab fields.

Table 50 OSPF tab fields

Field	Description
Enable	Enables or disables OSPF routing on the specified interface
HelloInterval	Length of time, in seconds, between the Hello packets that the router sends on the interface. This value must be the same for all routers attached to a common network.
RtrDeadInterval	Number of seconds that a router's Hello packets have not been seen before its neighbors declare the router down.

Table 50 OSPF tab fields (continued)

Field	Description
DesigRtrPriority	Priority of this interface. Used in multi-access networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network.
Metric	Metric for this type of service (TOS) on this interface. The default value of the TOS 0 Metric is (10^9 / ifSpeed). The value FFFF means “no route via this TOS.”
AuthType	Authentication type specified for an interface. Additional authentication types may be assigned locally.
AreaId	A 32-bit integer uniquely identifying the area to which the interface connects. Area ID 0.0.0.0 is used for the OSPF backbone.
AdvertiseWhenDown	Value used indicates whether or not a VLAN state change should be notified to layer 3, provided that the VLAN is configured as a routable interface. Also used for single routable ports. In that case, the criteria for state is PortOperStatus.

5 Click Enable.

6 Click Apply.

The OSPF tab closes, and the IP Address tab is redisplayed.

7 Click Close.

Configuring a null-encapsulation PVC

See “Configuring two ATM 1483 PVCs on the same ATM port” on page 141.

Associating the PVC with the VLAN

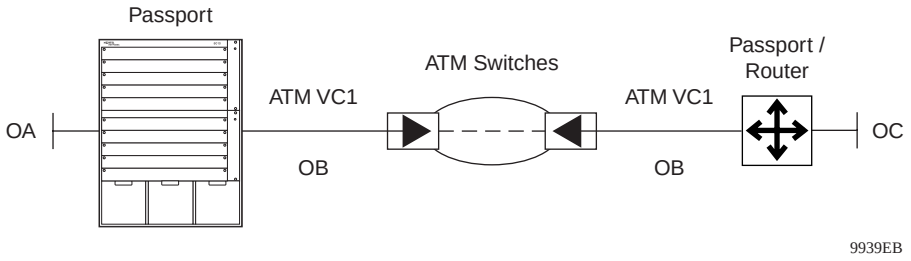
See “Associating the PVC with the VLAN” on page 139.

Follow the instructions there except, in the ConnectType field, select IP instead of bridged.

Configuring an IPX routing 1483 PVC

In the configuration shown in Figure 62, the 8672 ATM modules has an ATM 1483 PVC as the sole member of a VLAN configured for IPX routing.

Figure 62 IPX routing with ATM 1483 PVCs



Note: Each configured ATM 1483 PVC uses one VLAN. The 8672 ATM modules can be configured for a maximum of 256 VLANs per MDA and a maximum of 512 VLANs per card.

This configuration requires the following procedures:

- "Creating two VLANs byPort," next
- "Configuring IPX network numbers" on page 150
- "Enabling IPX forwarding" on page 151
- "Enabling IPX network number forwarding" on page 152
- "Configuring a null-encapsulation PVC" on page 153
- "Associating the PVC with the VLAN" on page 154

Creating two VLANs byPort

To create two VLANs "byPort," see "Creating a VLAN byPort and adding ports" on page 134. One VLAN must have only one ATM port. The second VLAN can have one or multiple Ethernet ports.

One VLAN must have only one ATM port.

The second VLAN can have one or multiple Ethernet ports.

Configuring IPX network numbers

To configure the IPX network numbers for both VLANs:

1 From the Device Manager menu bar, choose VLAN > VLANs.

The VLAN dialog box opens with the Basic tab displayed (Figure 53).

Table 44 on page 135 describes the VLAN Basic tab fields.

2 Click one of the VLANs.

3 Click IPX.

The IPX VLAN dialog box opens (Figure 63).

Figure 63 IPX VLAN dialog box

Table 51 describes the IPX VLAN dialog box fields.

Table 51 IPX VLAN dialog box fields

Field	Description
VlanId	Unique VLAN identifier.
NetAddr	IP subnet address of this VLAN.
Encap	Encapsulation format.

4 Click Insert.

The IPX VLAN, Insert dialog box opens (Figure 64).

Figure 64 IPX VLAN, Insert dialog box

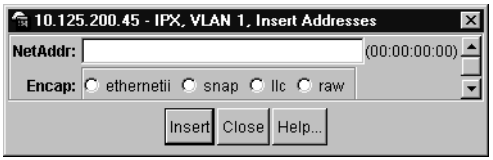


Table 52 describes the IPX VLAN, Insert dialog box fields.

Table 52 IPX VLAN, Insert dialog box fields

Field	Description
NetAddr	The IP address of this VLAN.
Encap	Encapsulation type: ethernetii, snap, llc, or raw.

5 In the NetAddr field, configure the IPX network numbers for the VLAN.

6 In the Encap field, click the encapsulation type.

7 Click Insert.

The IPX VLAN, Insert dialog box closes, and the IPX tab is redisplayed.

8 Click Close.

Enabling IPX forwarding

To enable IPX forwarding on both VLANs:

1 From the Device Manager menu bar, choose IPX Routing > IPX.

The IPX dialog box opens with the Globals tab displayed (Figure 65).

Figure 65 Globals tab

Table 53 describes the Globals tab item.

Table 53 Globals tab item

Item	Description
RoutingEnable	Enables routing.

2 Click RoutingEnable.

3 Click Apply.

4 Click Close.

Enabling IPX network number forwarding

To enable forwarding for the IPX network number:

1 From the Device Manager menu bar, choose IPX Routing > IPX.

The IPX dialog box opens with the Globals tab displayed.

2 Click the Circuits tab.

The Circuits tab opens (Figure 66).

Figure 66 Circuits tab

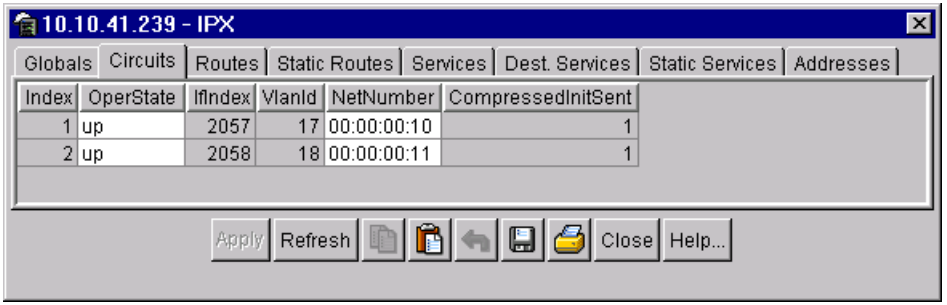


Table 54 describes the Circuits tab fields.

Table 54 Circuits tab fields

Field	Description
Index	Unique value assigned to each interface.
OperState	Current operational state of the interface.
Index	Interface Index.
VlanId	Unique VLAN identifier.
NetNumber	Network number.
CompressedInitSent	Compressed.

3 In the OperState field, enter “up” for all IPX network numbers created in this procedure.

4 Click Apply.

5 Click Close.

The Circuits tab closes, and the Globals tab is redisplayed.

6 Click Close.

Configuring a null-encapsulation PVC

See “Configuring two ATM 1483 PVCs on the same ATM port” on page 141.

Associating the PVC with the VLAN

See "Associating the PVC with the VLAN" on page 139.

Follow the instructions there except, in the ConnectType field, select Ipx instead of bridged.

Identifying packet loss during ingress/egress operations

This section describes typical configuration examples for traffic ingressing and egressing the 8672 ATM modules. The configuration examples explain the data flow and outlines the appropriate serviceability counters required to identify packet loss. You can display the packet loss incurred for each configuration example using CLI show commands.

This section includes the following topics:

Example 1: Ingress ATM to egress ATM

Figure 67 illustrates a network design providing for ingress ATM to egress ATM traffic over both bridged and routed PVCs.

Figure 67 Ingress ATM to egress ATM over bridged and routed PVCs

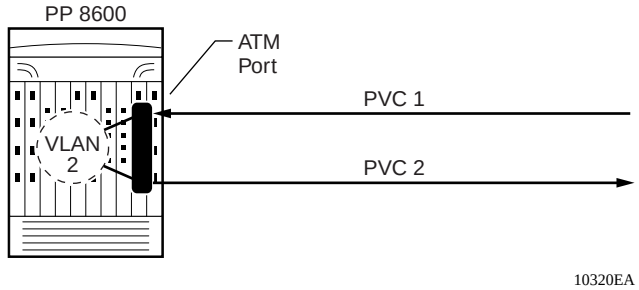
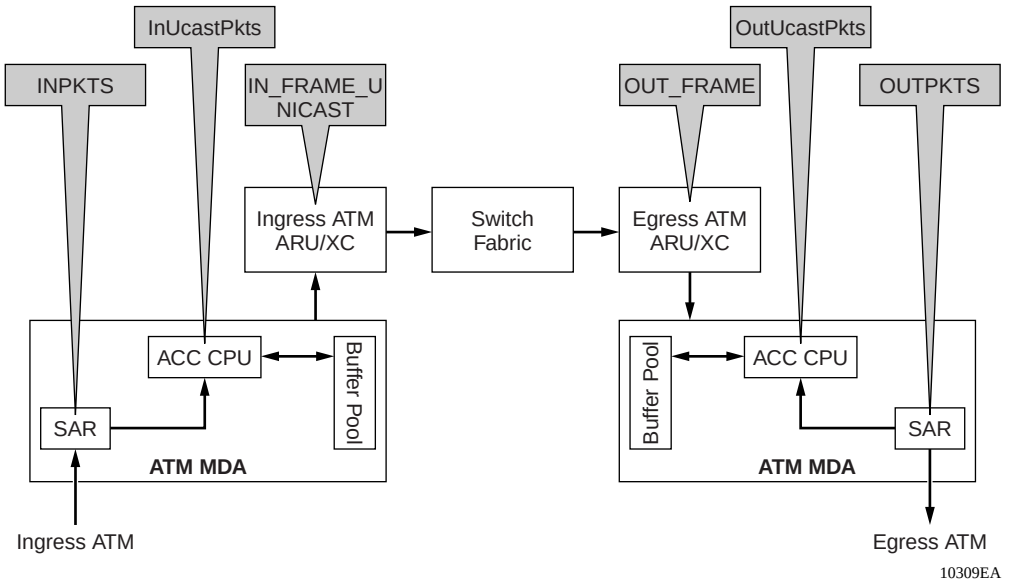


Figure 68 illustrates the data flow for Example 1 and the counter values that are used to calculate packet loss.

Figure 68 Data flow for ingress ATM and egress ATM on bridged or routed PVCs



Calculating packet loss on a bridged PVC in Example 1

To calculate packet loss for a bridged PVC configuration, perform these tasks.

1 Display the values for INPKTS, InUcastPkts, and IN_FRAME_UNICAST on the ingress ATM port:

- The ingress segmentation and reassembly (SAR) counter records the number of incoming packets — INPKTS — received on the ingress ATM port. To display this number, in the CLI, enter this command:

  show port stats atmp <*ingress atm port*>

- The ingress acceleration CPU counter (ACC CPU) records the number of unicast packets — InUcastPkts — received on the ingress port. To display this number, in the CLI, enter this command:

  show atm elan <*elan number*>

- The ingress ATM ARU counter records the number of unicast packets — IN_FRAME_UNICAST — sent from the ingress ATM port to the egress ATM port through the switch fabric. To display this number, in the CLI, enter this command:

  show port stats bridging <*ingress atm port*>

2 Display the values for OUT_FRAME, OutUcastPkts, and OUT_FRAME on the egress ATM port:

- The egress ATM ARU counter records the number of frames — OUT_FRAME — that are received from the ingress ATM port. To display this number, in the CLI, enter this command:

  show port stats bridging <*egress atm port*>

- The egress ACC CPU counter records the number of unicast packets — OutUcastPkts — forwarded to the egress ATM port. To display this number, in the CLI, enter this command:

  show atm elan <*elan number*>

- The egress SAR counter records the number of packets — OUTPKTS — sent out the egress ATM port. To display this number, in the CLI, enter this command:

  show port stats atmp <*egress atm port*>

3 The number of packets lost is the difference between the IN_FRAME_UNICAST value and the OUT_FRAME value.

Calculating packet loss on a routed PVC in Example 1

To calculate packet loss for a routed PVC configuration, perform these tasks.

1. Display the values for INPKTS, InUcastPkts, and IN_FRAME_UNICAST on the ingress ATM port:

   - The ingress SAR counter records the number of incoming packets — INPKTS — that arrive on the ingress ATM port. To display this number, in the CLI, enter this command:

     show port stats atmp <*ingress atm port*>

   - The ingress acceleration CPU counter (ACC CPU) records the number of unicast packets — InUcastPkts — received on the ingress port. To display this number, in the CLI, enter this command:

     show atm elan <*elan number*>

   - The ingress ATM ARU counter records the number of unicast packets — IN_FRAME_UNICAST — sent from the ingress ATM port to the egress ATM port through the switch fabric. To display this number, in the CLI, enter this command:

     show port stats routing <*ingress atm port*>

2. Display the values for OUT_FRAME, OutUcastPkts, and OUT_FRAME on the egress ATM port:

   - The egress ATM ARU counter records the number of frames — OUT_FRAME — that are received from the ingress ATM port. To display this number, in the CLI, enter this command:

     show port stats routing <*egress atm port*>

   - The egress ACC CPU counter records the number of unicast packets — OutUcastPkts — forwarded to the egress ATM port. To display this number, in the CLI, enter this command:

     show atm elan <*elan number*>

   - The egress SAR counter records the number of packets — OUTPKTS — sent out the egress ATM port. To display this number, in the CLI, enter this command:

     show port stats atmp <*egress atm port*>

3. The number of packets lost is the difference between the IN_FRAME_UNICAST value and the OUT_FRAME value.

Example 2: Ingress Ethernet to egress ATM over a bridged PVC

Figure 69 illustrates a network design providing for ingress Ethernet to egress ATM traffic, over a bridged PVC.

Figure 69 Ingress Ethernet to egress ATM over a bridged PVC

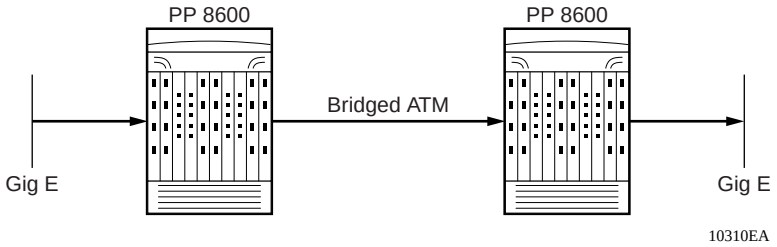
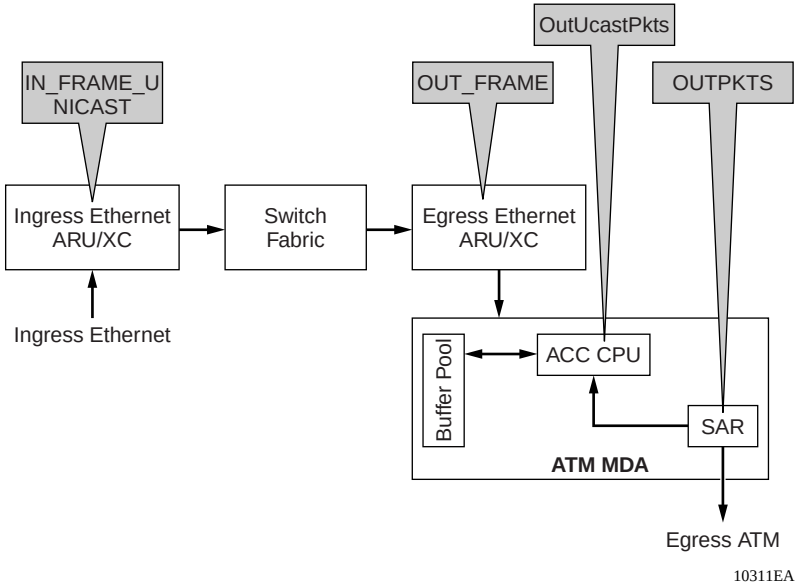


Figure 70 illustrates the data flow for Example 2 and the counter values that are used to calculate packet loss.

Figure 70 Data flow for ingress Ethernet and egress ATM on a bridged or routed PVC



Calculating packet loss in Example 2

To calculate packet loss for a bridged PVC in Example 2, perform these tasks.

1. Display the values for IN_FRAME_UNICAST on the ingress Ethernet port, and the values for OUT_FRAME, OUT_FRAME, and OUTPKTS on the egress ATM port:

   - The ingress Ethernet ARU counter records the number of unicast packets — IN_FRAME_UNICAST — sent from the Ethernet port to the ATM port through the switch fabric. To display this number, in the CLI, enter this command:

     show port stats bridging <*ethernet port*>

   - The egress ATM ARU counter records the number of frames — OUT_FRAME — that are received from the Ethernet port. To display this number, in the CLI, enter this command:

     show port stats bridging <*atm port*>

   - The egress ACC CPU counter records the number of unicast packets — OutUcastPkts — forwarded to the ATM port. To display this number, in the CLI, enter this command:

     show atm elan <*elan number*>

   - The egress SAR counter records the number of packets — OUTPKTS — sent out the ATM port. To display this number, in the CLI, enter this command:

     show port stats atmp <*atm port*>

2. The number of packets lost is approximately the difference between the IN_FRAME_UNICAST value and the OUT_FRAME value.

3. The difference between the OUT_FRAME value and the OutUcastPkts value should be approximately the same as the value of the OutDiscards. To display the value for OutDiscards enter the following command:

   show atm elan <*elan number*> output

Note: The values for OutUcastPkts and OUTPKTS are very similar which implies that there is no loss at SAR level.

Example 3: Ingress Ethernet to egress ATM on a routed PVC

Figure 71 illustrates a network design providing for ingress Ethernet to egress ATM traffic, over a routed PVC.

Figure 71 Ingress Ethernet to egress ATM over a routed PVC

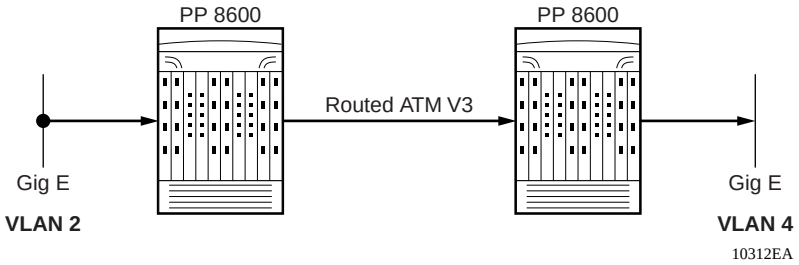


Figure 70 on page 158 illustrates the data flow for Example 3 and the counter values that are used to calculate packet loss.

Calculating packet loss in Example 3

To calculate packet loss for a routed PVC in Example 3, perform these tasks.

1. Display the values for IN_FRAME_UNICAST on the ingress Ethernet port, and the values for OUT_FRAME, OUT_FRAME, and OUTPKTS on the egress ATM port:

   - The ingress Ethernet ARU counter records the number of unicast packets — IN_FRAME_UNICAST — sent from the Ethernet port to the ATM port through the switch fabric. To display this number, in the CLI, enter this command:

     `show port stats routing <ethernet port>`

   - The egress ATM ARU counter records the number of frames — OUT_FRAME — that are received from the Ethernet port. To display this number, in the CLI, enter this command:

     `show port stats routing <atm port>`

- The egress ACC CPU counter records the number of unicast packets — OutUcastPkts — forwarded to the ATM port. To display this number, in the CLI, enter this command:

  show atm elan <*elan number*>

- The egress SAR counter records the number of packets — OUTPKTS — sent out the ATM port. To display this number, in the CLI, enter this command:

  show port stats atmp <*atm port*>

2 The number of packets lost is approximately the difference between the IN_FRAME_UNICAST value and the OUT_FRAME value.

3 The difference between the OUT_FRAME value and the OutUcastPkts value should be approximately the same as the value of the OutDiscards. To display the value for OutDiscards enter the following command:

show atm elan <*elan number*> output

Example 4: Ingress ethernet to egress ATM, with multiple ethernet ports in the same bridged VLAN

Figure 72 illustrates a network design providing for ingress Ethernet to egress ATM traffic, where multiple Ethernet ports belong to the same bridged VLAN.

Figure 72 Ingress Ethernet to egress ATM, with multiple Ethernet ports in the same bridged VLAN

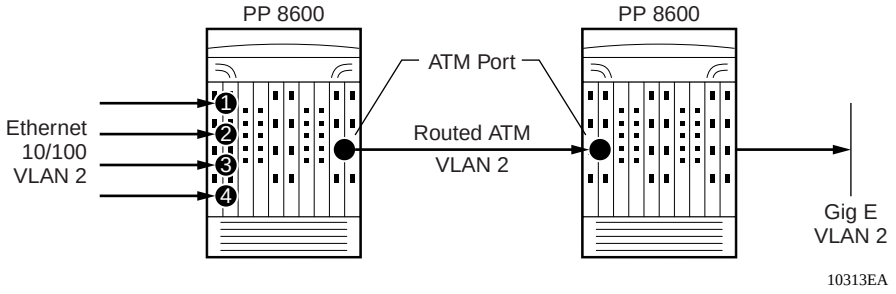


Figure 70 on page 158 illustrates the data flow for Example 2 and the counter values that are used to calculate packet loss. The data flow and counters for this configuration, Example 4, are similar.

Calculating packet loss in Example 4

To calculate packet loss for Example 4, perform these tasks.

1. Display the value for IN_FRAME_UNICAST for each Ethernet port in the bridged VLAN, by entering this command:

   show port statistics bridged <*ethernet port*>

2. Calculate the total of the IN_FRAME_UNICAST values.

3. Display the value for OUT_FRAME for the ATM port to which the bridged PVC belongs, by entering this command:

   show port statistics bridged <*atm port*>

4. Calculate the difference between the IN_FRAME_UNICAST total value and the OUT_FRAME value to estimate packet loss.

5. Display the value for OutUcastPkts for the ATM port, by entering this command:

   show atm elan <*elan number*>

6. Display the value for OUTPKTS for the ATM port, by entering this command:

   show port stats atmport <*atm port*>

7. Calculate the difference between the OUT_FRAME value and the OutUcastPkts value. The result should be near or equal to the value displayed for OutDiscards when you enter this command

   show atm elan <*elan number*> output

Example 5: Ingress ethernet to egress ATM, with multiple ethernet VLANs routed over ATM

Figure 73 illustrates a network design providing for ingress Ethernet to egress ATM traffic, where multiple Ethernet VLANs are routed over ATM.

Figure 73 Ingress Ethernet to egress ATM with multiple Ethernet VLANs routed over ATM

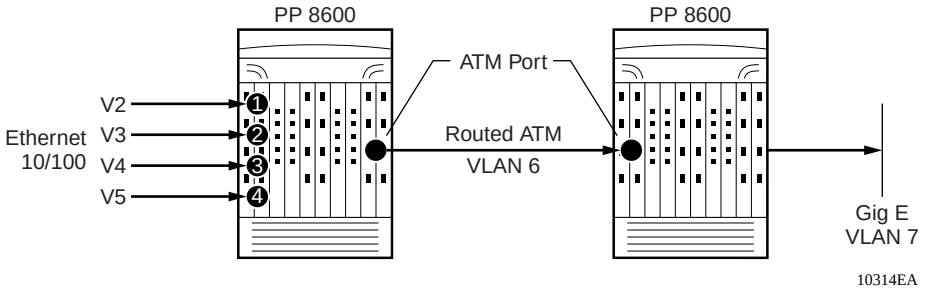


Figure 70 on page 158 illustrates the data flow for Example 2 and the counter values that are used to calculate packet loss. The data flow and counters for this configuration, Example 5, are similar.

Calculating packet loss in Example 5

To calculate packet loss for Example 5, perform these tasks.

1. Identify the IP address of each routable VLAN on the Ethernet ports.
2. In the routing table identify the IP address of the routed PVC which routes these VLANs.
3. Identify the ATM port on which this routed PVC is configured.
4. Perform the same procedures described in "Calculating packet loss in Example 4" on page 162, with bridging replaced by routing where required in CLI commands.

Example 6: Ingress ATM to egress ethernet over bridged and routed PVCs

Figure 74 illustrates a network design providing for ingress ATM to egress Ethernet over bridged and routed PVCs.

Figure 74 Ingress ATM to egress Ethernet over bridged and routed PVCs

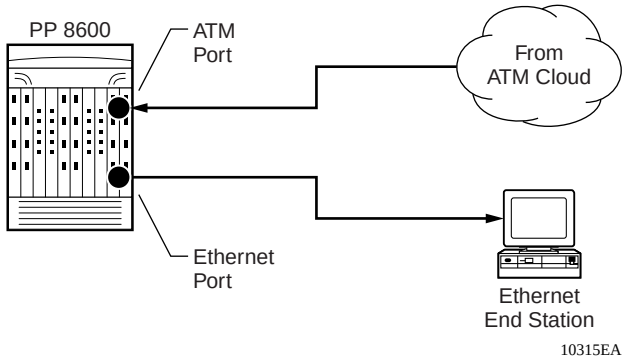
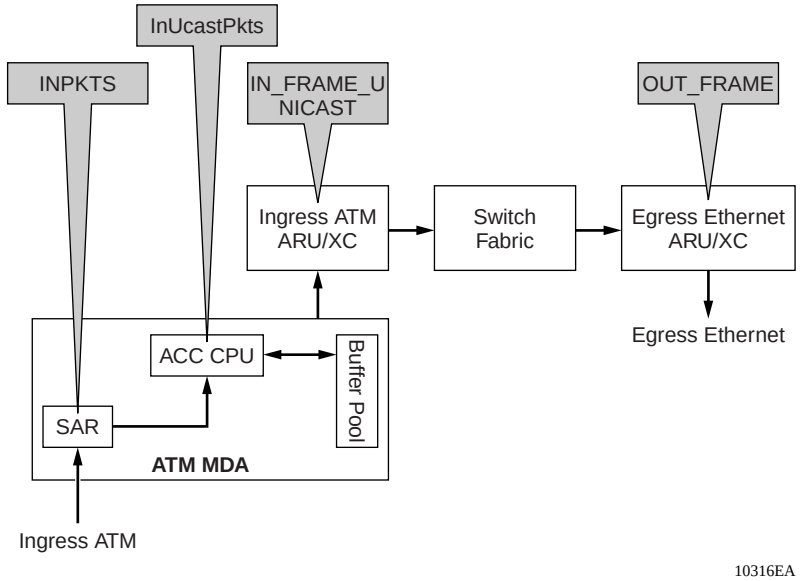


Figure 75 illustrates the data flow for Example 2 and the counter values that are used to calculate packet loss.

Figure 75 Data flow for ingress ATM to egress Ethernet over bridged and routed PVCs



Calculating packet loss for bridged PVCs in Example 6

To calculate packet loss for Example 6, perform these tasks.

1. Display the value for INPKTS received on the ingress ATM port, by entering this command:

   show port stats atmp <*ingress atm port*>

2. Display the value for InUcastPkts on the ingress ATM port, by entering this command:

   show atm elan <*elan number*>

3. Display the value for IN_FRAME_UNICAST from the ingress ATM port, by entering this command:

   show port stats bridging <*ingress atm port*>

4. Display the value for OUT_FRAME on the egress Ethernet port, by entering this command:

   show port stats bridging <*ethernet port*>

5. Calculate the difference between the IN_FRAME_UNICAST value and the OUT_FRAME value to estimate packet loss.

Calculating packet loss for routed PVCs in Example 6

To calculate packet loss for routed PVCs in Example 6, perform these tasks.

1. Display the value for INPKTS received on the ingress ATM port, by entering this command:

   show port stats atmp <*ingress atm port*>

2. Display the value for InUcastPkts on the ingress ATM port, by entering this command:

   show atm elan <*elan number*>

3. Display the value for IN_FRAME_UNICAST from the ingress ATM port, by entering this command:

   show port stats routing <*ingress atm port*>

4. Display the value for OUT_FRAME on the egress Ethernet port, by entering this command:

   show port stats routing <*ethernet port*>

5 Calculate the difference between the IN_FRAME_UNICAST value and the OUT_FRAME value to estimate packet loss.

Note: Packet loss for ingress ATM to egress Ethernet examples is lower than packet loss for ingress Ethernet to egress ATM examples.

Chapter 6
Web Management

Web management allows you to monitor the 8672 ATM modules through a World Wide Web browser from anywhere on your network. The Web interface provides many of the same monitoring features as the Device Manager software.

Refer to *Getting Started with the Passport 8000 Series Switch Management Software* for information on:

- Accessing your switch through the Web interface
- Descriptions of the Web page layout

Use the Web interface ATM folder to monitor the 8672 ATM modules parameters. When you access the Web interface, the System page is displayed. The ATM folder is in the navigation pane on the left of the system page (Figure 76).

Figure 76 System page

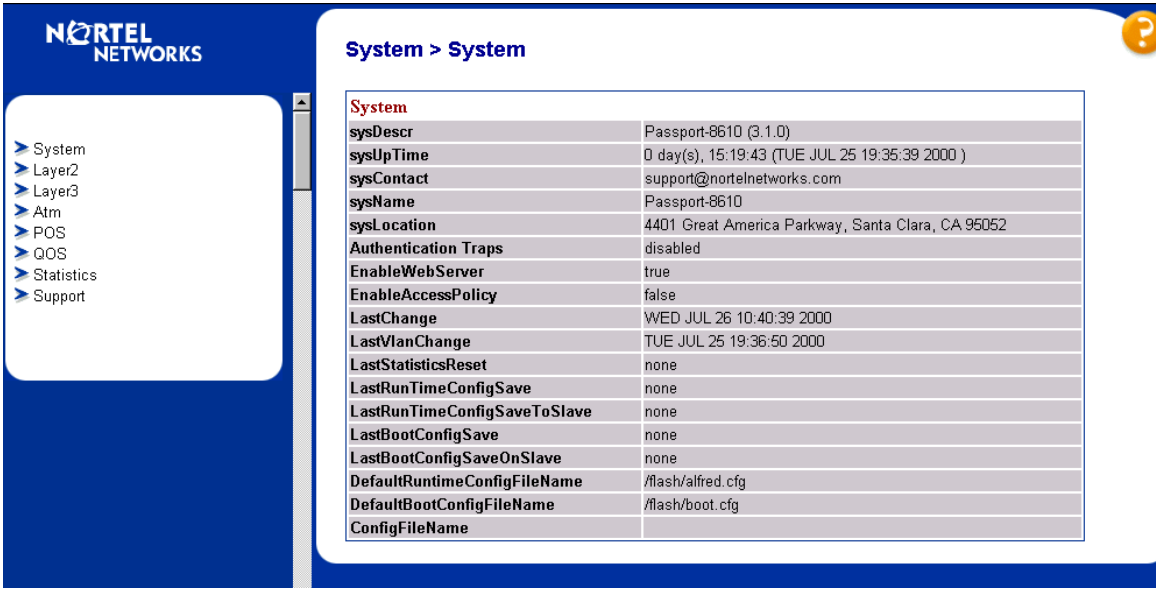


Table 55 describes the fields displayed in the System page.

Table 55 System page fields

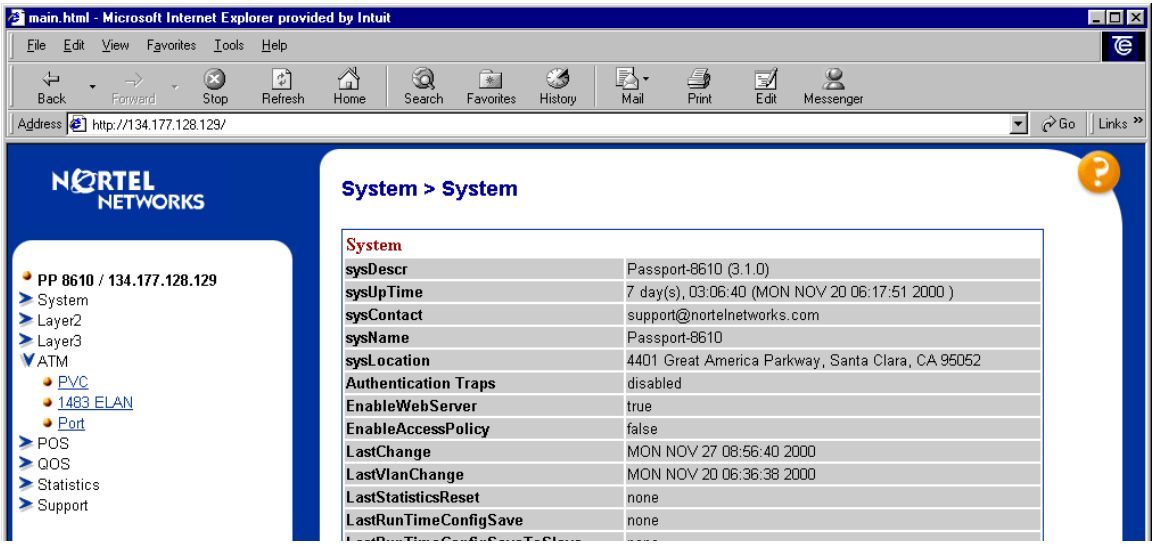
Field	Description
sysDescr	System Description
sysUpTime	Value of system up time.
sysContact	Contact name.
sysName	Port name.
sysLocation	System location.
Authentication Traps	Enables or disables traps.
EnableWebServer	Enables the Web server.
EnableAccessPolicy	Enables access limits to be set.
LastChange	Value of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last reinitialization of the local network management subsystem, the value is zero
LastVlanChange	Value of sysUpTime for the VLAN

Table 55 System page fields (continued)

Field	Description
LastRuntimeConfigSave	Value of sysUpTime at the time that configuration was saved.
LastRuntimeConfigSavetoSlave	Value of sysUpTime at the time that configuration was saved.
LastBootConfigSave	Value of sysUpTime at the time the last reboot occurred.
LastBootConfigSaveOnSlave	Value of sysUpTime at the time the last reboot saved configuration changes.
DefautlRuntimeConfigFileName	Default runtime configuration file name.
DefaultBootConfigFileName	Default configuration file name.
ConfigFileName	Configuration file name.

When you click ATM in the navigation pane, the headings in the ATM menu are displayed. The headings provide options for viewing ATM parameters (Figure 77).

Figure 77 ATM menu



To view the current PVC parameters, in the ATM menu, click PVC. The PVC page opens (Figure 78).

Figure 78 PVC page

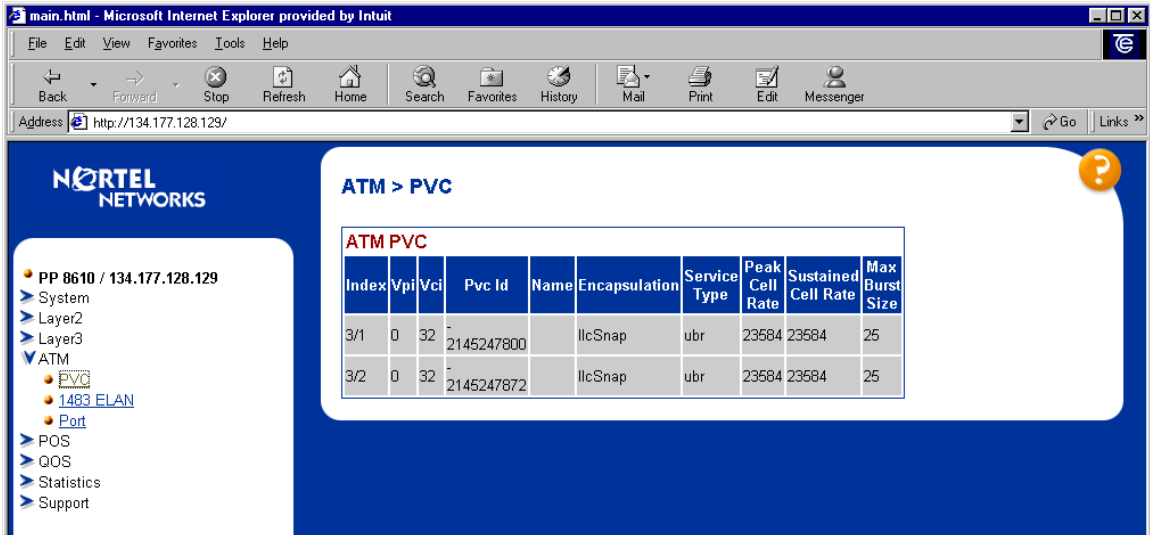


Table 56 describes the fields displayed in the PVC page.

Table 56 PVC page items

Field	Description
Index	Unique value assigned to each interface.
Vpi	VPI number.
Vci	VCI number.
Pvc Id	PVC IDs, minimum of 1 required.
Name	Emulated LAN Name.
Encapsulation	LLC/SNAP, NULL; If LLC/SNAP, then for bridge IP or IPX.
Service Type	Unspecified bit rate or variable bit rate.
Peak Cell Rate	Peak cell rate, in cells/second.
Sustained Cell Rate	Upper bound of the cell rate that is long relative to that of the PCR.
Max Burst Size	Maximum burst size determined by the signaling method. It is coded as a number of cells that can be transmitted at peak rate and still conform to the overall algorithm; only applicable if it is VBR.

To view the current 1483 ELAN parameters, in the ATM menu, click 1483 ELAN. The 1483 ELAN page opens. Figure 79 shows the left section of the page. To view the entire table, use the scroll arrow at the bottom right corner. Figure 80 shows the right section of the page.

Figure 79 1483 ELAN page, (left section)

Figure 80 1483 ELAN page, (right section)

Table 57 describes the fields displayed in the 1483 ELAN page.

Table 57 1483 ELAN page items

Field	Description
Index	Unique value assigned to each interface.
Elan Id	Internal ID of the ELAN.
Num Pvc Ids	Number of PVC pairs used in the ELAN.
PvcIds	PVC IDs, minimum of 1 required.
Vlan Ids	VLAN to which the ELAN belongs.
Connect Type	Type of connection: bridged, IP, or IPX.
Vlan Mac Address	MAC address assigned to this VLAN. Used in IP and IPX routed circuits when there is no appropriate destination MAC to use.
Dummy Mac Address	Dummy MAC address assigned to this VLAN. Used in IP and IPX routed circuits when there is no appropriate source MAC to use.
Local Ip Address	Local IP address for connection type IP.
Remote Ip Address	Remote IP address for connection type IP.
In Arp Send Enable	Enables ARP sending on the ELAN for connection type IP.
In Arp Send Interval	Interval of ARP sending for connection type IP.
Ipx Vlan Encap Method	IPX VLAN encapsulation method.
Ipx Network Num	Network number; IPX only.
StgId	Spanning tree group ID. Only for bridge connection type.
Stg Tagged Bpdu Vlan Id	The VLAN ID used for tagging BPDUs.

To view the current port parameters, in the ATM menu, click Port. The Port page opens (Figure 81).

Figure 81 Port page

Table 58 describes the fields displayed in the Port page.

Table 58 Port page items

Field	Description
Index	Interface Index.
Num Vpi Bits	For OC-3, 11 bits split between NumVpiBits and NumVciBits. NumVciBits cannot exceed 6 bits for OC-3c. For OC-12c, 13 bits split between NumVpiBits (default is 4) and NumVciBits (default is 9). NumVpiBits cannot exceed 8 bits for OC-12c. For DS-3, 12 bits split between NumVpiBits (default is 4) and NumVciBits (Default is 8). NumVpiBits cannot exceed 7 bits for DS-3.
Num Vci Bits	This field is read only. It takes remaining bits from NumVpiBits. For example, if NumVpiBits is 3 for OC-3c, then NumVciBits is 8.
Media Type	Either SMF (single-mode fiber) or MMF (multi-mode fiber).

Table 58 Port page items (continued)

Field	Description
Scramble Enable	Enables or disables scrambling.
Framing Mode	Shows the framing for the port: • sonet (Synchronous Optical Network), the standard format used in North America. • sdh (Synchronous Digital Hierarchy), the standard format used worldwide except in North America.
Clock Source	Sets the framing clock source for the port to: • loopTimed means clocking is derived from SONET line. • freeRunning means clocking is derived from on-board clock. Note that if you have two connected 8672 ATM modules, you must set both to freeRunning or one to freeRunning and one to loopTimed; do not set both to loopTimed.
Line Speed	45 MBS, 155 MBS or 622 MBS
Loop Back Mode	Sets the loopback mode to: • off • internal • external
Mac Address	The MAC address assigned to this VLAN (used in IP and IPX routed circuits when there is no appropriate destination MAC to use).

Appendix A
Technical Specifications

This appendix lists the technical specifications for the 8672 ATM modules.

Environmental specifications

Operating temperature:	5° to 40° C (41° to 104° F)
Storage temperature:	-25° to 70° C (-13° to 158° F)
Operating humidity:	85% maximum relative humidity, noncondensing
Storage humidity:	95% maximum relative humidity, noncondensing
Operating altitude	3,000 m (10,000 feet) maximum
Storage altitude	Up to 9,000 m (30,000 feet) above sea level
Free fall/drop:	ISO 4180-s, NSTA 1A
Vibration:	IEC 68-2-6/34
Shock/bump:	IEC 68-2-27/29

Physical specifications

Height:	1.050 inches
Width:	12.968 inches
Depth:	10.950 inches
Weight (single module):	3.12 lbs.

Performance specifications (64-byte packets)

Mean time between failure (MTBF)	85,000 hours
Frame length:	64 to 1750 octets

Safety agency approvals	UL Listed (UL 1950)
	CUL CSA 22.2 No. 950
	IEC 950/EN 60950
	CE mark
	CB Scheme Test Report and Certification
	NOM (NOM-019-SCFI-1994)
Electromagnetic emissions	
Meets requirements of:	US: FCC, CFR 47, Part 15, Subpart B, Class A
	Canada: ICES-003, Issue-2, Class A
	Australia/New Zealand: AS/NZS 3548:1995, Class A
	Japan: VCCI V-3/97.04, Class A
	Taiwan: CNS 13438,Class A
	EN 55 022:1998/CISPR 22:1997), Class A
	CE Mark
	Electromagnetic Immunity: EN55024:1998/ CISPR24:1997

Appendix B
Factory defaults

Table 59 shows the default settings on the 8672 ATM modules as it comes from the factory, as well as the management tool that you can use to change parameters.

Table 59 Factory default settings for the 8672 ATM modules

Parameter	Default
VPI bits OC-3	4
VPI bits OC-12	4
VPI bits DS-3	4
VCI bits OC-3	7
VCI bits OC-12	9
VCI bits DS-3	8
Scrambling	Enabled
Framing	SONET
Clock source	Free-running
Loopback mode	Internal
Encapsulation	LLC-SNAP
Bit rate	UBR
Traffic shaping	Disabled
F5 OAM requests	Disabled
F5 OAM responses	Enabled

Appendix C
Supported/unsupported PVCs

Although you can configure higher VPI numbers than those supported PVCs specified in Table 60 (without a warning or an error message displaying), these higher numbers do not function properly and must not be used. It is important to note that some of these values have changed since the previous release of Passport 8600 code and so read through this table carefully prior to upgrading your Passport 8600 switch.

Table 60 Supported /unsupported PVCs on the 8672ATM/ATME/ATMM module

Interface	VPI bits	Unavailable PVCs
OC12	1 (VCI Bit max value 4095) 2 (VCI Bit max value 2047) 3 (VCI Bit max value 1023) 4 (VCI Bit max value 511) 5 (VCI bit max value 255) 6 (VCI bit max value 127) 7 (VCI bit max value 63) 8 (VCI bit max value 31)	1.3324 through 1.4095 3.1276 through 3.2047* 7.252 through 7.1023 14.252 through 14.511 ** 28.252 through 28.255 ** None (that is, all values are available) None (that is, all values are available) None (that is, all values are available)
OC3	1 through 6	None (that is, all values are available) ***
DS3	1 (VCI Bit max value 2047) 2 (VCI Bit max value 1023) 3 (VCI Bit max value 511) 4 (VCI Bit max value 255) 5 (VCI Bit max value 127) 6 (VCI Bit max value 63) 7 (VCI Bit max value 31)	1.0 through 1.2047 2.0 through 3.1023 4.0 through 7.511 8.0 through 15.255 16.0 through 31.127 32.0 through 63.63 64.0 through 127.31

* In software releases prior to 3.5.0, values 3.1260 through 3.2047 were unavailable.

** In software releases prior to 3.5.0, all values were available.

*** In software releases prior to 3.5.0, values 1.252 through 1023 were unavailable.

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